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# MIND & HAND

ANNUAL
MAY '97.

# Industrial Training School.

INDIANAPOLIS,
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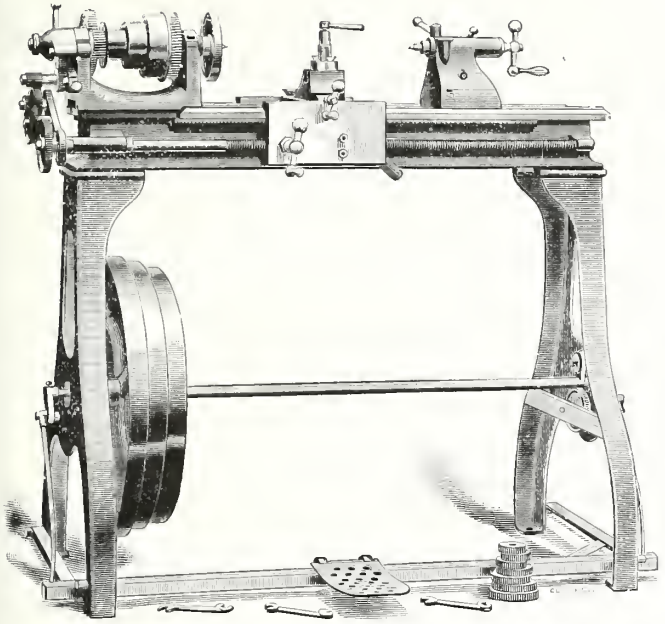

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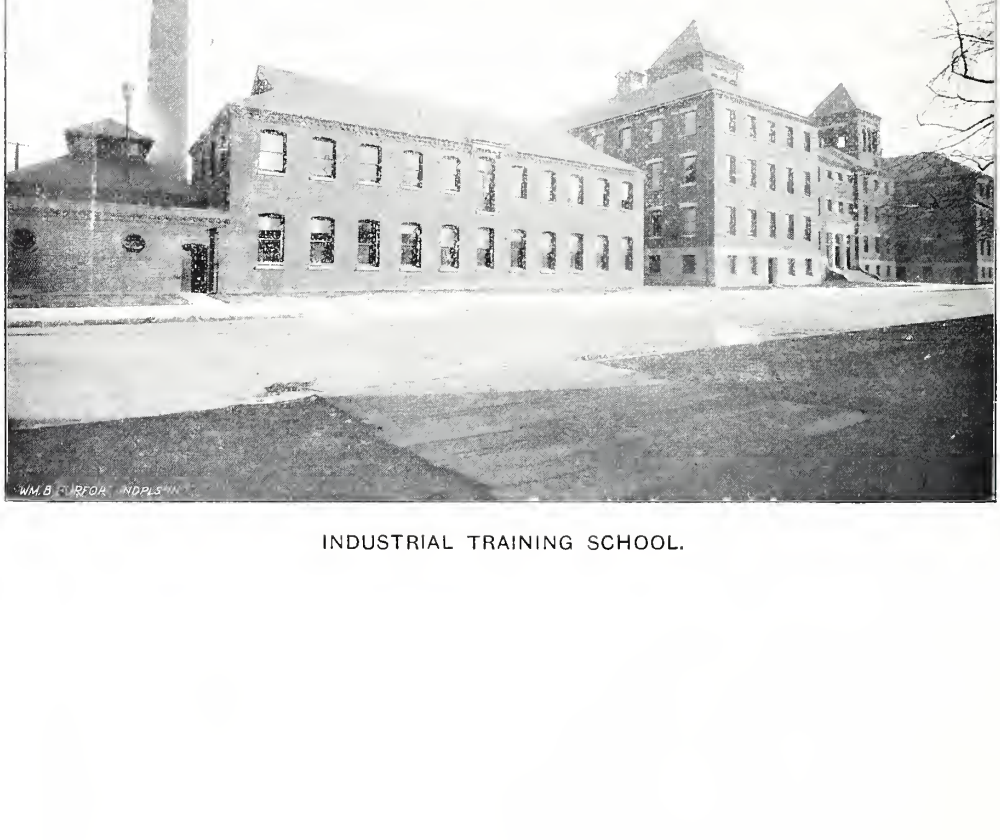

INDUSTRIAL TRAINING SCHOOL.

# MIND AND HAND.

"EDUCATION IS THE CHEAP DEFENSE OF NATIONS."—BURKE.

VOL. III. No. 1. INDIANAPOLIS, IND. MAY, 1897

## MIND AND HAND.

Published in the interests of intellectual and manual education, by the students of The Industrial Training School.

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"Practical education is an education of the brain to intelligence and of the hand to skill. The combination will give the highest directive power."—RUNKLE.

## . . EDITORIAL . .

IT may be a question in the minds of some readers as to the purpose of this paper. To them we will say, it has been the editors' aim to make the MIND AND HAND a report of the work accomplished in our school during the past year. In preparing the paper, we have attempted to give equal recognition to each department, and although the space is limited in several cases, we believe that ample attention has been devoted to each line of work. The variety, in regard to contents, should serve to enhance the attractiveness of the paper. Furthermore, we take great pleasure in announcing that all literary work herein contained, unless otherwise mentioned, has been done by the students of our school. In addition to the original aim, we hope that the paper may also serve as a happy memento of the '96–'97 school year of the Industrial Training School.

H. O. S.

IF we may judge from the increased attention which is being given to the teaching of English in our schools, we may justly come to the conclusion that the fact that English is an important factor in our education is making, itself more widely and deeply felt each succeeding year. The English language is our common vehicle for conveying thought; in fact, it is such common property that, day after day, we ruthlessly abuse it, scarcely ever pausing to consider that its possibilities are beautiful, and, at times, magnificent. Just think of what Shakespeare has created for us from this "common" language. The pupils of the I. T. S. are generously provided with the means wherewith to enjoy and understand the highest and best in our language. Our school library is as yet comparatively small, but every wide awake I. T. S. boy or girl has discovered, that it makes up in quality

372566

## CLASS POEM—FEB., 1897.

Awake! arise! the day is come,
And night's long shadows disappear;
The bee among the garden flowers
Tells that the working hour is here.
The sun above the hills is high;
The fields in sunny stillness lie;
And the morning breeze sends a gentle quiver
Through the trees that border the distant river.

The meadow lark's bright song ascends
To greet the newborn summer's day,
Till echo trills the melody,
So faint and clear, so far away.
The sky is dyed in deepest blue;
The grass is sparkling, wet with dew;
And fragrance comes from the op'ning flowers
That grow unseen in the wayside bowers.

Another day, our day, has come.
The east is reddening with the light,
As o'er the misty mountain tops
The sun appears upon our sight.
A world is opened to our eyes—
A world of light—of sunny skies.
The air is sweet, and the bees are humming,
Telling the time for work is coming.

The day of life dawns only once;
The morning hastens into noon
The midday into dusk descends,
And day is done—but done too soon.
While young the morning, sluggards wait;
When evening comes, they wake too late.
The man of action resteth never!
His place in life be ours forever!

WILL STEINHAGEN.

## FEBRUARY CLASS, '97.

Hippoty, hippoty, hippoty 'leven,
We're the class of '97.
Hurrah for the yellow, hurrah for the white!
Hurrah for the daisy; it's all right!

THE February Class of '97 does not wish to boast of its works, but it does feel pleased over some of the things it has done in its career. "To be afeard of my deserving were but a weak disabling of myself."

It was the first class to organize in the 11 B. This movement caused other classes to do likewise, and thus introduced that most desirable thing, class spirit. While yet in the 11 B it planned a reception for the graduating class, and was ably assisted by the June Class, '96. In the 11 A it assisted the 12 B Class in a reeeption. As 12 B's this class gave a very successful entertainment, a stereopticon leeture given by Mrs. Gibson on "Some Chateaux of France." About $40 was made and put into the bank, to be added to later on. In the 12 A another entertainment was given, a eoncert. This proved profitable, also, and the money in the bank was doubled. With this money was purchased their present to the sehool, the two beautiful statues which now stand on the platform in the auditorium.

It was this class also whieh petitioned for the change, whieh has been made in the eommencement exereises. The pleasing innovation of class-day, too, is owing to their efforts.

However, these things could not have been done had it not been for the hearty and faithful co-operation of the teaehers and the prineipal of the sehool. The elass thanks them sincerely for their kindness, and wishes them God-speed in their noble ealling.

As for the class, may it bear in mind both its temporary and permanent mottoes:

"The secret of success is constancy of purpose."

And:

"Action, not thought, is the end of life."

B. H.

CLASS OF JUNE, 1897.

## THE GRADUATING CLASS.

IT is with regret that the June Class of '97 bids adieu to her "Alma Mater." It is like going from firm land to uncertain seas, seas to us, as yet unexplored. What awaits us on that great unknown, we can not tell. To some of us it may be a smooth channel; but to many it will be a rough sea.

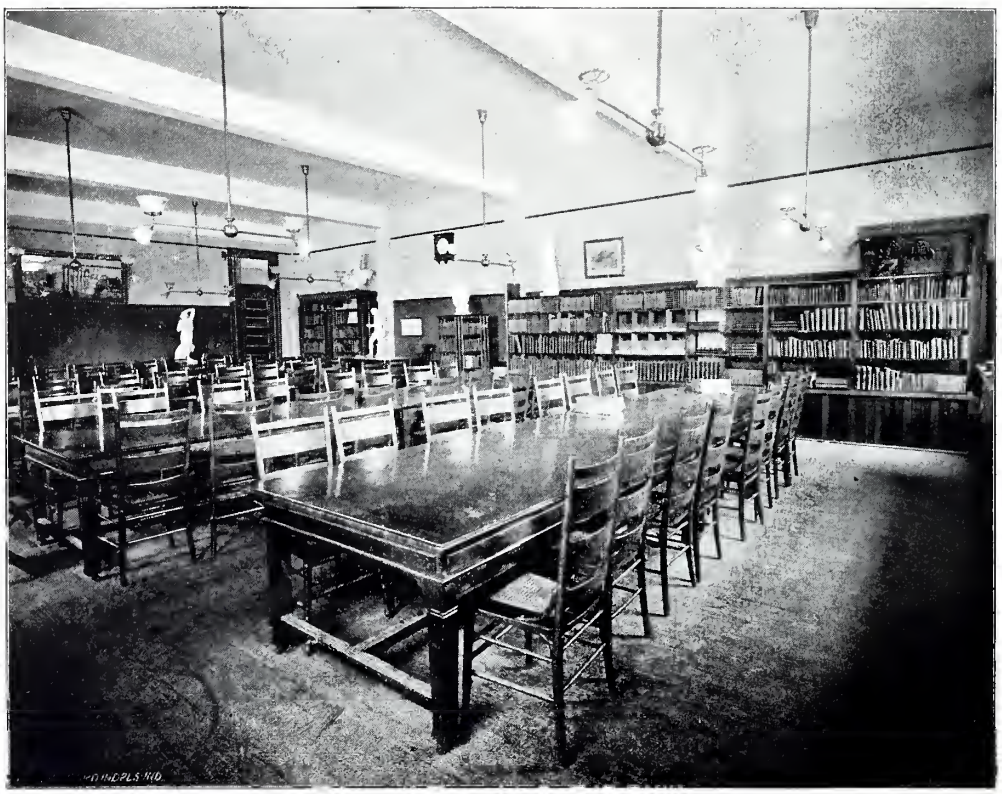
The class as an organization has been very successful. The following are Presidents in order of election: Gertrude Zerbee, Hans O. Stechhan, Fred Stevens and Fred Koekert, each serving two terms consisting of ten weeks each. The present officers are: Fred Koekert, President; Edgar Kiser, Vice-President; Fannie Trees, Treasurer and Secretary; Minnie Bowen, Historian.

The class looks back over its various social gatherings with much pleasure, the halloween parties, the New Year's eve "watch party," the tramp after paw-paws and the meeting of the class as the "Sartor Resartus Club"—all recall pleasant recollections.

The class motto is, "Who lacks an aim ne'er finds success." The colors are Green and White, and the flower is the white rose.

The graduating class wishes to extend its hearty thanks to the teachers of the institution, for the pains they have taken with us, and for the trouble and work we have caused them. To Mr. Emmerich we are very grateful, for the fatherly care he has taken of us, and the many favors he has granted us.

We wish our successors all happiness and prosperity. G. C. Z.



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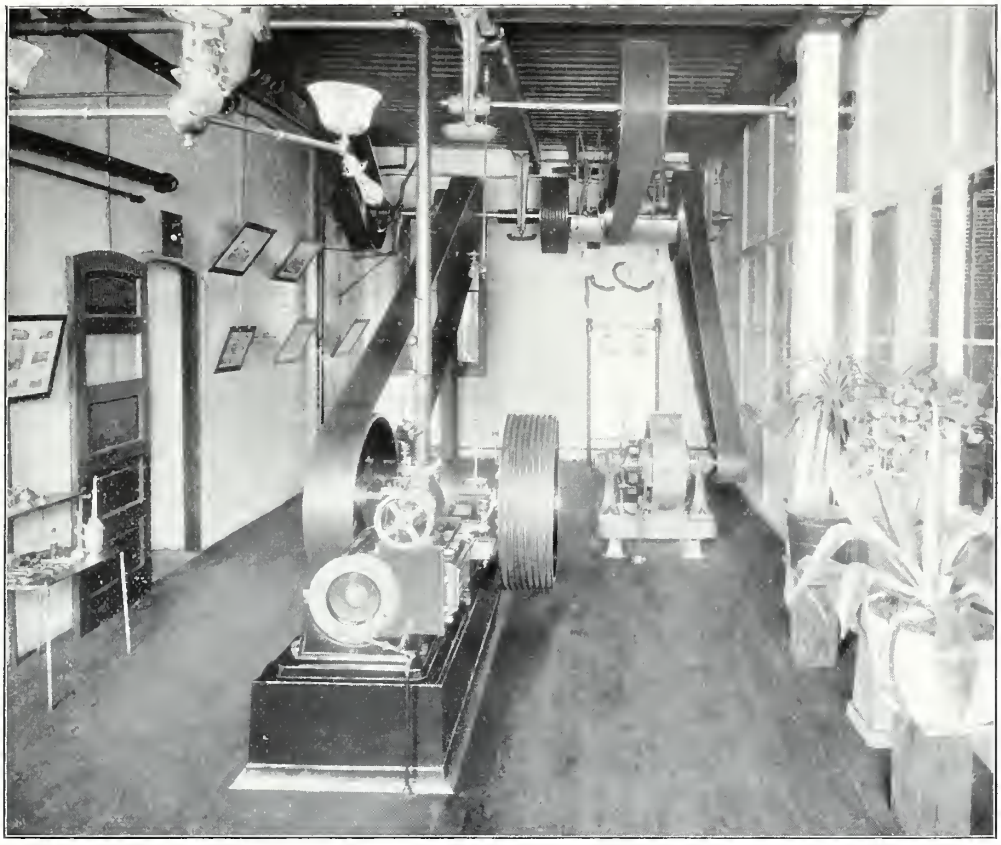

ENGINE AND ELECTRIC MOTOR.

## WHAT PROMINENT PEOPLE THINK OF THE INDUSTRIAL TRAINING SCHOOL.

WILLIAM H. Maxwell, Superintendent of Public Schools at Brooklyn, N. Y.: "I saw no work which I did not approve. I saw a great deal of work that excited my admiration. The building is admirably planned for the purposes for which it is used. It is indeed a model for other cities to imitate."

Hon. William E. Dodge, of New York: "Among the pleasant and profitable incidents of my trip to Indianapolis, I shall always remember my visit to the Industrial Training School. I have had some knowledge of these schools in various sections of the country, and I know of no one more wisely equipped, more cheerful or apparently doing better work than the one in Indianapolis. It must be a large factor for good in your State."

Horace S. Tarbell, Superintendent of Public Schools at Providence, R. I.: "Having recently had the pleasure of a visit to your school, I was surprised at the evidence of prosperity which the building, its equipments, its pupils and teachers demonstrate. I believe that there is no better equipped institution for its purpose maintained by public school authorities in the United States."

Mr. A. J. Lane, Superintendent of Public Schools, Chicago, Ill.: "I congratulate the young people of Indianapolis on the

magnificent provision that has been made in their new Industrial Training School for their mental and manual education. The complete equipment of the school for laboratory work, the departments of cooking, sewing, manual training, stenography and typewriting, in addition to the instruction in the higher English branches, offer advantages equal to those presented in the very best institutions in the country."

Edwin P. Seaver, Superintendent of Public Schools, at Boston: "Your school was not in session when I visited it, therefore my opinion is limited. I can only say that I was very well pleased with what I saw, more especially with the Mechanic Arts Department."

E. B. Cox, Superintendent of Public Instruction, Xenia, Ohio: "The Training School of Indianapolis is a model institution, in its plan, purpose, and equipment. I am a firm believer in training the mind and hand alike, regardless of what the future may have in store. This education, dealing with the concrete and material, rather than with the abstract and remote, is in keeping with the wonderful progress in the world about us. The fact that the capacity of your school is already taxed to its utmost, indicates its success. The whole atmosphere of the school is exhilarating."

E. R. Booth, Principal of the Technical School, Cincinnati, O.: "The building is the most complete that I have ever seen; in fact, I believe that it is the best in this country. Neither the hand nor the mind is neglected, and the work is so arranged as to make each help the other. Fortunate, indeed, is the young man or the young woman who can receive his secondary education in such a school."

Frank A. Hill, Secretary of the State Board of Education, Boston, Mass.: "Unfortunately, your school was not in session the day that I visited it. However, I went over the building carefully, and saw on every hand the signs of wise and generous provisions for varied industrial training and culture I was glad to note, in particular, that the girls were not overlooked, as they too frequently are in industrial training plans elsewhere. I am confident that a school that produces so favorable an impression in the absence of its pupils and teachers, can not but strengthen that impression when it is seen at work in all its departments."

President Smart, Purdue University, Lafayette, Ind.: "Those of your graduates who have come to Purdue are first-class men, and your equipment certainly equals that of any manual training school in the country. One of the tests of an institution is the view which the students take of it. So far as I am able to observe, your students are very enthusiastic. This is perhaps a minor evidence of success, but nevertheless a very good one. In addition, I have reason to know that the greatest of care has been exercised in arranging the courses of study and in the selection of the faculty."

Hon. John P. Irish, San Francisco, Cal.: "The army of Cæsar, in Gaul, was the wonder of the ancient world, because it was full of skilled handicraftsmen, who were ready for any required constructive work, from building a bridge to making a harness for a war horse.

"During our civil war, one advantage of the Union Army was derived from the fact that the North had developed handicrafts, and every commander had artizans amongst his enlisted men who could build cars, run locomotives, shoe horses or bridge streams.

"Within the last thirty years, however, this general knowledge of the skilled trades has declined, through certain limitations upon apprenticeship. With such decline finally comes a distinct loss of national force, and the country loses part of that offensive and defensive power, to be exerted in emergencies which affect the national life.

"Industrial schools will avert the danger, and will give also that personal independence so necessary to the highest citizenship. The Indianapolis Industrial Training School impressed me deeply as a means to independent manhood and a high safeguard to the Republic."

## THE DEBATE.

THE students of the I. T. S. are always more or less interested in questions of national importance, but for the few weeks directly preceding February 12, they were especially interested in the arbitration question. This extra enthusiasm was caused by the announcement of a debate between the Senates of the Indianapolis High School and our own institution.

As the Senate of the High School issued the challenge, the choice of sides and the naming the place of meeting became our privilege. In a joint committee of the representatives of the two Senates, February 12, the eighty-eighth anniversary of the birth of Lincoln was selected as the date, and the Training School auditorium was named as place of meeting. After considerable difficulty, the following question was finally selected: "*Resolved*, That we are ready for the dismemberment of armies and submitting all international questions to a permanent board of arbitration." The negative side was considered best and taken upon the grounds, that the world is not at the present time prepared for any such radical changes as the question involved.

On the stated evening Ernest Talbert, Laurence B. Davis, George B. Langsdale and Claude M. Bowers, the representatives of the High School, were gathered around one table on the left-hand side of the platform, and on the other side were Horace Gwinn, Felix F. Ballard, Arthur Meng and Hans O. Steehhan, the four selected to uphold our laurels. All did well and were complimented by Superintendent Goss and the judges, upon the showing they made; but much to the surprise of many disinterested, as well as the close friends of the I. T. S., a decision was rendered unfavorable to our boys.

Though a formal defeat was recorded against us, the result was not so humiliating as might be supposed, because the power shown by the speakers representing our school, effectually hushed the rumor that this is strictly a mechanical institution, and clearly demonstrated that the classical department is equal, in every way, to that of any other high school in the State. More than this, another link was forged in the chain that is finally to bind the two Indianapolis High Schools in good fellowship and coöperation.

HOWARD YOUNG.

## JUNE, '97.

Around us is the sea of life,
With waves of action dashing high;
And, as a craft in ship-yard building,
We scent the salt that's passing by.

Four years ago the keel was laid
For Ninety-seven's ship;
And now she's ready to be launched,
To make her trial trip.

The sea is rough and dangerous,
The current leads astray;
But to the pilot Knowledge trust,
He'll choose the safest way.

Then let the storm its fiercest rage,
We'll send before the wind;
Unto the calm that follows trust,
In it contentment find.

Whate'er you do, be firm and brave,
And to your purpose cling;
Spread wide the canvas of your hope,
And in a chorus sing:

"Who lacks an aim, ne'er finds success;"
Do battle for what's right;
Hold always toward the port of truth,
And seek the source of light.

The anchor's weighed, the ship is off,
Now filling are the sails;
And through the distance comes a voice,
"Success through life's stern gales."

HANS O. STECHHAN.

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# Literary Department.

## OUR BILLY.

MINE is a simple story, but to one who leads a quiet life, the smallest incident has its weight.

There are six of us at home—three boys and three girls. Since my mother's death my sister has been housekeeper. She resigned all the gayety of the social life that was then opening to her to become a mother to us, the younger ones. All her time is spent in governing the household; all her plans are for the welfare of her younger brothers and sisters; she is constantly devising new schemes for the common good and we are sometimes led to believe she cares for nothing else.

She has one pet, a little canary bird. My aunt gave him to her when he was only a few months old and he soon became her greatest delight. She hung about his cage till he knew her face, held him in her hand till he was no longer afraid and was ready to tend him any hour of the day.

He became so tame she would open his cage and let him fly about. When she worked, he sat on her shoulder; when she sang, Billy sang. In singing, his little throat swelled almost to bursting with the love and gratitude he bore her.

But to us he was a little fiend. If one of us ventured to put his hands near the cage, Billy would fly at them like a little fury, his wings outspread, his eyes sparkling and all the while making a furious little squeaking noise to inspire terror in our hearts. He teased the cook by throwing seeds out of his cage to the dining room floor. His way of annoying papa was peculiarly funny.

Billy's cage hung near the head of the table where papa sat at dinner. One day papa began to brush his head impatiently, first with one hand and then the other, "Na—what is that?" He looked around and there was Billy, his head stretched out as far as the wires of his cage would allow him, throwing seed shells that were on the ledge outside of the cage, down on papa's bald head. Papa punished him for this severely by bringing him a great bunch of seed grass. You may well suppose we were fond of him.

On the avenue, on my way to school, was a bird store. We had stopped there so often to supply Billy's wants that we were well acquainted with the owner and we sometimes stopped just to see and hear the birds. There were hundreds of canaries in little wooden cages. Among them was one who seemed to me to be just like our bird. Sometimes I wished we had him, too, to be a twin-brother to our pet; I wondered if he had the same tricks, but when I brought my hands near he would flutter about affrighted.

One afternoon I was left at home alone. To amuse myself while I worked I opened Billy's cage, forgetting that all the doors in the house were open. Billy hopped out gaily, glad of his freedom, but after a few moments evinced a desire for the greater freedom of the outside world.

I saw him fly out of the door, and for a moment sat stunned. Then, giving vent to a piercing shriek, I ran out into the street, just in time to see Billy change his course and fly over the housetop, far, far away.

I covered my face with my hands and stumbled back into the house.

What should I do? I could not, positively could not, face my sister and tell her. But Billy was gone, irrecoverably gone.

A ray of hope came to me suddenly—the bird at the store; but that would be telling a lie, a thing she despised. Should I tell the truth and see her sorrow, or lie and bear the self-reproach and in the end her contempt? But she loved the little fellow so much.

The fear that I might still change my mind hurried me to the store. I bought the bird, but how unlike Billy he was. When I put him in Billy's cage he fluttered about, making plaintive litte cries. I knew he would betray me, and shook my fist at him in anger and despair.

I heard the gate slam and knew my sister had come, so I picked up my work and tried to be composed. First the thread tangled, then the needle bent, and then it broke, and I began to cry.

My sister stood in the door watching me and taking off her gloves. At last she said "Well, what is the matter, child?"

I made no answer. I did not dare to look up, so I sobbed a little harder. She came to me and picked up my work. See-

BOOK-KEEPING ROOM.

ing nothing so very wrong, she said: "You'll find a package of needles in my basket." I did not rise to get the needles, so she stood quietly by me. At last she said: "There is something else the matter; I want you to tell me." The only answer she received was a command to "Go 'way."

She went to the bird, I suppose to wait till I was quieter. When she neared that dreadful cage she started, then called to him, "Billy, Billy." The little creature fluttered about frantically.

She turned to me, her face white with horror. "Sister, did the cat catch him?" No answer.

In a few moments she added, in a broken voice, "Well, it is better he died at once than to be out alone with nothing to eat and the cold to fight."

That settled it; she should believe him dead; I could not tell her the real truth now, still I would say nothing about it.

The bell rang. Exultant voices were heard outside, "Missis, Missis, here's your bird; we caught him out there by Court Street" And half a dozen ragamuffins tumbled in, holding out Billy, our darling, to us.

I was relieved. Billy is safe and more impertinent than ever. But somehow, strange as it may seem, the new bird is the dearer to me.

THERESA MARIE BELL.

MECHANICAL DRAWING ROOM.

## ON LAKE ERIE.

ONE year ago last summer I took a pleasure trip to Put-in-Bay, an island in Lake Erie. After a day's tiresome riding on the train, we arrived in Sandusky, a beautiful town in Northern Ohio. The next day we started for the island, and after two hours' pleasant riding, we reached our destination.

Put-in-Bay is one of a large cluster of islands situated in the southern portion of Lake Erie. It is a well-known summer resort, and people go there from all parts of the United States to spend the summer months. Every day excursion boats arrive from the neighboring cities — Cleveland, Detroit and Toledo.

One pleasant trip that we had, was a row around the island of Gibraltar, so called because of its steep and rocky shores. It was upon this island that Commodore Perry placed the flagstaff after his famous victory over the British in September, 1813.

During our stay, we took advantage of one of the weekly excursions to Cleveland. We left the island early in the morning, because Cleveland is sixty-three miles from Put-in-Bay, and it requires five hours to make the trip. The water was very rough, and the lake was covered with white-caps. Upon arriving, we first visited Lake View Cemetery, and there saw the famous tomb of Garfield. This is a magnificent structure of granite and highly polished marble.

We took a ride along Euclid avenue, the beautiful residence street of Cleveland, and one of the finest in the United States. When we had seen the most important things in the city, we went back to the boat and started for Put-in-Bay. The weather had cleared up since morning, and going back we had one of those beautiful moonlight rides, so delightful on a lake.

CHAUNCY W. BROWN,
9 B Grade.

## MY LITTLE FRIEND.

WHAT a solemn expression for one so young! This is what I have heard a number of persons remark, as they gazed at my little friend.

She is indeed an odd-looking child, without any of that happy, thoughtless look seen on the faces of almost all young children. Her large, blue eyes, which are rather deeply set, have quite a wise look; her skin is white and transparent and never takes on a pink glow, unless she is slightly irritated; her hair, which is light in color, frames a face which would otherwise be very plain. Her nose is small, but prominent, and her lips, unusually colorless, curl slightly upward at the corners.

But seeing the child when she has been humored or favored in some way, and is perfectly happy, completely changes the expression. The lips part in a broad smile, showing a row of white teeth, the eyes glisten with joy, so that the plain child of a moment ago can scarcely be recognized.

She does not seek the company of children, but is contented to sit and play with her dolls or read quietly from a story-book. When any of her little friends come to visit her, however, she brings out all her toys and seems as bright as any one, and there is not a prettier face anywhere.

GERTRUDE WAHL, 9 A.

## THE MANUFACTURE OF PAPER.

THE earliest nations of whom we have any knowledge must have had something on which to record events. The inhabitants of each country took whatever they found near their homes for this purpose. The old Chaldeans, who lived thousands of years ago, made tablets of clay and marked on them with a wedge-shaped instrument. The Egyptians utilized the leaf of one of their native plants, and called it papyrus, from the name of the plant.

Although our word paper is derived from this Egyptian word, the process of making paper is in no respect like that of the ancients. It is made in a very complex manner and of different kinds of materials. The finest, which is made of linen rags, is called lined paper, while the cheaper grades are made of rags, old paper and wood pulp. The following is a short explanation of the process of making new paper out of old.

The old paper is first placed in a large tub, where a machine grinds it into pulp and mixes it with water. From here it runs into a large tank in the cellar, where it is left until ready to be converted into paper.

This pulp must go through a long row of cylinders. The first few of these are covered with wire cloth and take out most of the dirt from the pulp. As it is carried along, the pulp forms in sheets on the cylinders. These sheets can be made smaller by wrapping cotton cloth on the edges of the rollers, as pulp will not adhere to cotton. It goes through several of these rollers, and is then taken off by cylinders covered with woolen blankets. While on these the water is pressed out and the sheet becomes firm enough to pass on through several sets of heated rollers, by which it is thoroughly dried. From here it rolls between a pair of cylinders which give it the required thickness. Then it is cut into sizes by a machine, and is ready for commercial use.

In making paper out of rags, a great deal more labor is required. They must be sorted, dusted and bleached before undergoing the above process.

The Egyptians used their paper only to write on, but to-day it is used for innumerable purposes. As it is free from a great many of the defects of wood and iron, it is rapidly taking the place of these in modern manufacturing. NESHA MARKS,
10 B Grade.

## "MY CAVALRY CHARGE."

AN IMAGINATIVE SKETCH.

THINGS were beginning to get dangerous. A large shot plowed into the ground almost at my horse's feet and threw the dirt high in the air. The battle was already involving most of our men. Our company of cavalry, with one or two others, were the only troops not in the engagement.

Our horses pawed and stamped the ground impatiently and seemed as eager as the men to get into the fight.

The enemy seemed to be getting the better of us. We were superior to them in infantry, but their artillery was committing fearful havoc in our lines. "That battery must be taken," shouted the general, riding up to our captain, "or we shall lose the day."

Our cavalry was ordered to charge and capture the guns. At the word of command we dashed forward, our sabres flashing in air as they came from the scabbards. We swept down the gentle slope in front of us and commenced the ascent on the other side. Already many saddles were empty, still on we galloped.

A shot struck the calf of my leg and went on through, killing my horse under me. I was dashed to the ground and pinned there by the weight of the dead animal. The cavalry swept on and left me lying there. My leg was bleeding, and I was stunned by the violence of the fall, but I instinctively turned my head to watch my comrades as they charged up the hill, and the words of the officer rang in my ears: "If you capture the guns the day is ours." It seemed a long time before they reached the top, but at last I saw them close in upon the gunners. Next I heard a cry. Was it victory or defeat? I knew not, for I had fainted.

WILL BALLARD,
10 A, English.

# The Birds Return

DURING the days, when the windows of the sky are swept clearly open and radiantly blue, when the leaves, which have jealously clung to the stem all winter, now yield and drop at last, when they have fallen to travel from field to field, then the woodland songsters return.

In the middle of February comes the robin, who but heralds the approaching members of feathered emigrants. Poor lonely creature, his ruddy breast gleams warmly amid the bare boughs; he is waiting for his paler-vested mate who will have much news to relate, a month later.

Pressing upon the footsteps of the robin will come the croaking blackbird, and the red-headed woodpecker will again be seen in his accustomed haunts, prying among dead trees with a thoughtful eye to future stronghold within.

Some frosty morning in March the wee bill of the chipping sparrow will ring out with renewed charm. His small person is perched demurely within the gloom of the cedar where he means to have a nest anon, while his cousin, a shy little song-bird with brown stripes, will drop into the stubble with a flirt of white tail-feathers, and the vesper sparrow has registered for the summer.

One morning during early April, when just awake, the apple tree by your window will be filled with a brisk bit of song—sweet, sweeter, sweet—ringing in decisive small tones, and, like a glint of summer sunlight, the tiny big eyed summer yellow-bird chips confidently through the branches. He has come to stay.

As the middle of April approaches, many distinguished visitors arrive.

The white-eyed vireo, whose strange white iris foretells how snappily his song will ring in your ears—tu-whit, tu-wheeo! Many days it will sound mockingly from the other side of the creek, from the far side of the wood, from the valley below, from the hill above, before the singer will disclose his identity to any but old friends.

April is not over yet but there will come a morning whose breath will speak of June, in the voices of the yellow-breast, mellow, round, clear and loud—pritty, pritty, pritty.

Soon young bluebirds are fluttering their unwonted wings, baby song-sparrows are being tended, and towsled, young robins have quitted the nest to look like ragged, overfed babies trotting closely after father and mother. One tiny nest is full of naked young field sparrows, their wee dimensions almost transparent.

All the birds are at home. May has come and with it a new generation, which fitly ends the chronicle of the old.

ALEXIS MANY,
11 B, English.

ADVANCED PHYSICAL LABORATORY. (North Half.)

## THE POETICAL.

THE practical and the poetical are not opposed in their tendencies. It is absurd to hold that the thoughts that inspire in us reverence for the Creator and His mighty works, can not be turned to our material and moral advantage. Love for the poetical is but an appreciation of beauty and fundamentally a general love of nature.

Before proceeding further, however, we must distinguish between the poetical person and the dreamer. The poetic person does not love nature less than the dreamer, but result and progression more. In no way can this be better illustrated than through the impressions members from these classes would receive from anything beautiful or poetical. Suppose, for example, that three persons, a poet, an engineer and a dreamer, should view an aged oak. The engineer would note with what firmness it was rooted and how sturdily it withstood the blast, and straightway would enter into his mind some application of this principle that for ages to come would stand as a monument to his usefulness. The poet would notice the parasites that clung to its massive trunk, and be inspired to write of our relation to and dependence upon a Supreme power. The dreamer would gaze as intently as the rest, and his only thought

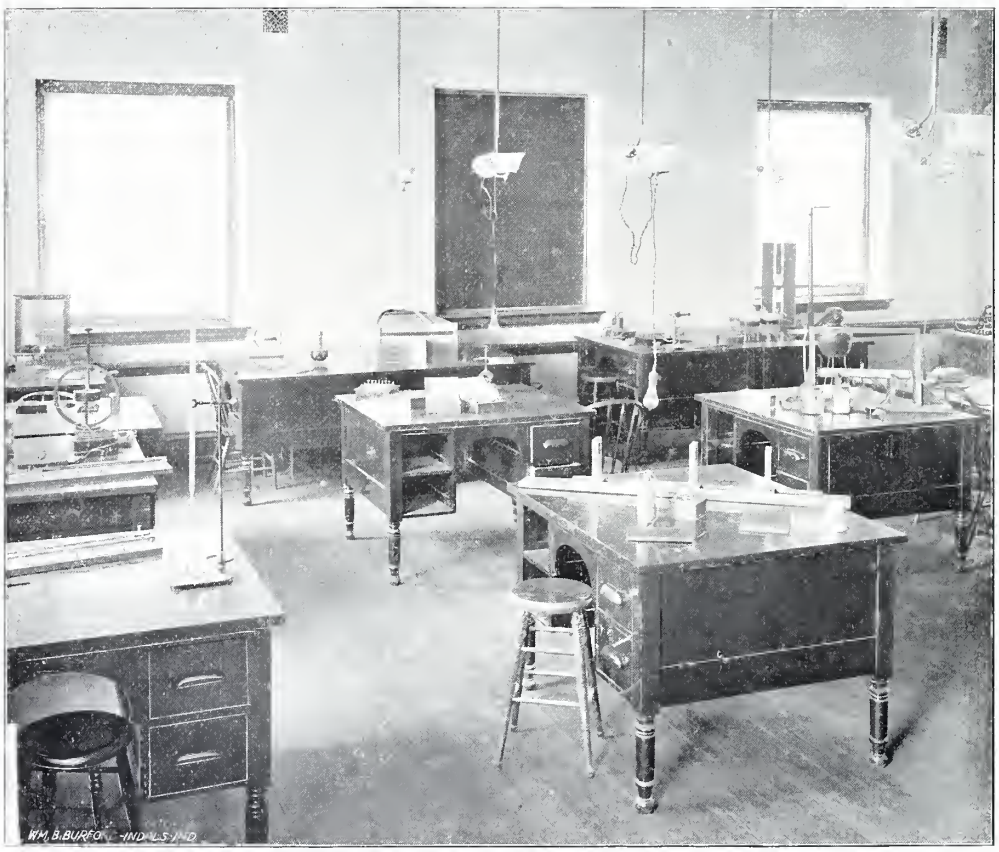
would be a speculation as to what the leaves appeared to be whispering to each other. The engineer has given to the world a device of universal usefulness; the poet a soul-inspiring poem, and the dreamer—nothing.

Our greatest achievements (poetic, scientific, social and political), have been accomplished through a love and study of nature and her many forms. Our greatest poets have received their brightest inspirations from nature, but they did not deal with impossible sentimental nonsense, but rather with the motives, the passions, and a universal study of mankind. Our greatest scientific and mechanical results have been but adopted from nature. Our great social and political advancement but illustrates, though in a small degree, the unity and obedience to law that exists throughout the universe.

Thus we see that the men that have done the most for mankind were the most poetic. It is also apparent that the dreamer has not the true poetic instinct. Our great men have not been dreamers, but useful, moving members of an advancing civilization.

Nature is a subject for our admiration and love, but only through the medium of useful speculation This great universe, in all its perfection and unity was not created a subject for the play of an idle imagination, but for our elevation and good.

HUBERT HILDEBRAND ROGERS,
11 A, English.



ADVANCED PHYSICAL LABORATORY. (South Half.)

## GEOFFREY CHAUCER.

A SHORT and heavy figure, a genial, fresh-looking face, every lineament of which suggests fun and good humor, and a natural, unobtrusive manner—this is my picture of Chaucer after reading "The Prologue to the Canterbury Tales."

The characteristics of his style which gave me these impressions are, its utter simplicity and delightfully confidential tone, its broad and gentle humor which glows brightly in every line, and above all, its child-like gracefulness which is so apparent.

He did not select ideal and abstract subjects and soar up into the clouds in an attempt to awe or entrance his readers. On the contrary, his subjects and his treatment of them are such that one may enjoy and gain the full benefit of them without leaving *terra firma*. This could not be better illustrated than it is in his prologue where he has taken a character from almost every calling of life, which existed at that time, and described each in a most naive and interesting manner. We are not taken by storm with a sudden outbust of sparkling wit for there is nothing flashy or brilliant about Chaucer. But his steady, quiet humor never grows monotonous, and his satire is never biting. Speaking of the Friar, he says:

> "For though a widow had not a sho,
> So pleasant was his '*In principio*,'
> That he would have a farthing 'er he went."

COOKING LABORATORY.

And again, in his description of the Man of Law, he gives an example of his pleasant satire which, though very effeetive, contains not the slightest hint of bitterness or malice.

This man of law was wise; he was famous; he had great fees paid him; he had rich robes: his clients looked upon him with awe and respect, because he was so important and knowing, and had so many great things to look after. The reader is about to sympathize with it all. Then comes that subtle and truly Chaucerian stroke:

"And yet he seemed busier than he was."

What an innocent tone these words have, and yet we can almost see the smile lurking in the eorners of his mouth as he writes them, and we can not help smiling also.

But beeause Chaucer is wont to show the merry side of everything, we must not think him ineapable of deep and serious thought. Some biographers have aecused him of being irreligious, basing their aeeusations upon the light way in which he speaks of the monks and friars. Frank and unpretending himself, he despised deceit and pretense in others, but he was always willing to acknowledge and revere a truly religious man, as his tribute to "The Parish Priest" plainly shows:

"Wide was his parish with houses far asunder,
Yet, ceasing not for rain nor thunder,
In sickness and in pain he saw
The farthest in his parish, great and small.
This noble example for his flock he wrought,
That first he worked and afterwards he taught.
And this figure he added thereunto:
That if gold rust, what shall iron do?
He hated pomp and asked no reverence,
Nor made him an hypocritical conscience;
But Christ's lore and his apostle's twelve
He taught, but first he followed it himself."

Lowell says that Chaucer "mused good naturedly over the vices and follies of men, and, never forgetting that he was fashioned of the same clay, is rather apt to pity than eondemn."

Chaucer gives us many lessons in morality, but they are incidental and indirect; therefore they do not detraet from the freshness of the poem. Knowing that he had lived during that period which immediately followed the Norman Conquest, and that he received his earliest inspiration from the poets of Southern Europe, such as Dante and Petrarch, we can easily recognize in him a delicate sentiment and a courtliness of expression which is foreign to a purely English writer. But back of this the northern Teutonic blood is manifest in his good common sense and praetical ideas. He was fortunate enough to have possessed both temperaments, and this advantage, with his natural simplicity and his knowledge of both court life and humble, lowly life, made his poetry the pieturesque, healthy and charming literature that it is.

Lillie Poehler,
12 B, English.

## SPENSER'S "FAËRY QUEENE."

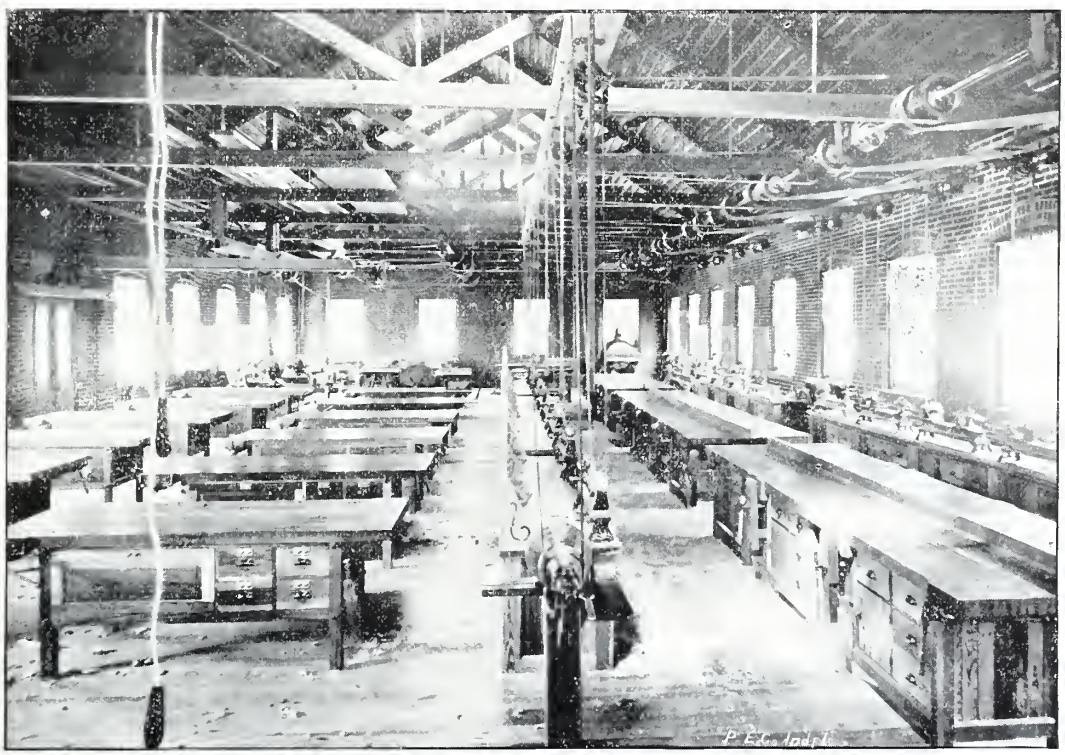
MANY times during my English work, and also in my readings (espeeially do I reeall quotations in the novels of Walter Scott and James Fenimore Cooper), I have happened upon referenee to Spenser's "Faëry Queene," but nothing in all I read prepared me for the true character of the poem, until I actually took up the study of it. Over a year ago I found a picture of "Una and the Lion." I admired it, it left a distinct impression on my mind. But I did not know who Una was at that time, so I passed the picture by as some artist's fancy. When I came to Una and the Lion in the "Faëry Queene," that picture instantly came before my mind and I immediately hunted it up, and from that time on both picture and story had increased ten-fold in interest. I think I shall always

remember "Una and the Lion," for the reason that picture and story will be closely connected in my memory.

The name "Faëry Queene" suggested to my mind something purely fanciful, in which nymphs, naiads and gnomes held sway, gathered around some very beautiful fairy, who was queen by right of superior beauty. So I was much surprised to find the poem an allegory, and especially surprised because the theme was so serious. I like the higher allegory. The conception, it seems to me, is very beautiful, both in spirit and form of expression. I think the poem as poetry, alone, has a value much higher than that of a "good school exercise," as I have heard it called. Spenser shows that same poet's observation, that same love of nature which we found in Chaucer, and some of his epithets, especially those which add color to a picture, remind me of Sir Walter Scott's "Lady of the Lake." Occasionally he drops into a quaint mode of expression which sounds much like Chaucer.

The canto which left the strongest impression with me was the one in which Spenser describes Duessa's descent into Hades. The picture is gloomy, but it has a vividness which the other cantos lack.

I was very glad when I came to the part of the story in which Duessa is exposed in all her hateful, horrible deformity. I was so pleased that I scarcely cared to read farther, for it seemed to me that the knight's troubles must certainly be ended. I think Spenser has drawn this character excellently well. One immediately thinks



WOOD-WORKING SHOP.

of Tennyson's eoneeption of a very similar charaeter, that of Vivian. Both of these women are "fair without and foul within."

Although I do not like the lower interpretation of this poem, I think Spenser struck clearly and forcibly the key-note of the age in which he lived, that of bitter religious strife.

MINNIE BOWEN,
12 A, English.

## WITHOUT.

Once, in the twilight of a wintry day,
One passed me silent, struggling on his way,
With head bowed low, and hands that burdens bore,
And saw not how, a little space before,

A woman watched his coming, where the light
Poured a glad welcome through a window bright,
Set thick with flowers that showed no fairer bloom
Than her sweet face turned outward to the gloom.

Yet when his foot, with quick, impatient stride,
But touched the step, the door swung open wide,
Soft hands reached swiftly out with eager hold,
And drew the dear one in from storm and cold.

O love! whose eyes, from some celestial light,
Behold me toiling, burdened through the night,
Tender of every blast at which I cower,
Yet smiling still, to know how brief the hour,

Keeping within thy radiant, love-lit home,
Some glad surprise to whisper when I come,
'Tis but a breath till the door I win
And thy dear hands will swiftly draw me in.

ESTA OLSEN.

## THE GERMAN CLASS.

PERHAPS some chance reader of this article has felt a curiosity concerning the way in which a foreign language is learned.

I felt the same curiosity when I entered the recitation room on the first day of the term and found some twenty others assembled, each, like myself, thirsting for knowledge (?)

Our class motto might well have been: "When in Germany, do as the Germans do," for, odd as it may seem, the first thing introduced to us was—German conversation!

We commenced to learn *how* to speak German by *speaking* German!

A very simple rule, apparently.

(I will say, however, for the benefit of the uninitiated, that it is truly wonderful how much German you can understand when it is cleverly *acted out* by your teacher.)

Somewhat encouraged by the fact that we could really comprehend the new language, we were confronted with a fresh difficulty:

We all had to "learn our letters!"

This is more of a task than might be supposed, when you consider that many of the letters differ but slightly in form, and if carelessly glanced over, lead to absurd changes in the words.

Armed with our alphabetical key, we proceeded to unlock the mysteries of the grammar, with its vocabularies, translations, declensions, conjugations, and what not.

It is true, we have our trials.

We have learned the bitterness which befalls him who neglects the remorseless "der, die, das."

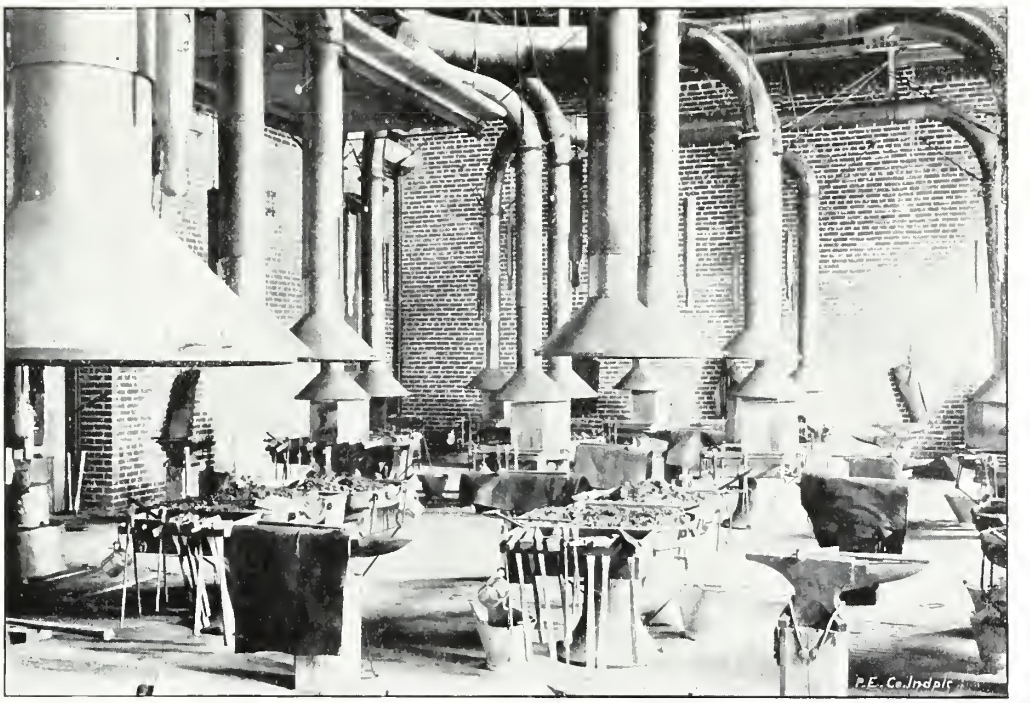
Even now we are struggling in the toils of "Gegenwart—Mitvergangenheit—Vorzukunft," etc., but we heartily agree with the immortal poet—

> "Things like these, you know, must be
> In every famous victory."

Last, but emphatically *not* least, our recitations are conducted wholly in German.

Not only questions, but *answers* also, must be in this language, for, strange to say, the gentleman who teaches us can not understand a word of American!

BESSIE MARSEE BROWN.




FORGE ROOM.

## VIRGIL.

SEVERAL months ago, with a great deal of fear and trembling, the advanced Latin class began reading the Æneid. They have now more than half finished the poem, and what was at first a slow and laborious task has, by constant practice, become a pleasant and comparatively easy one.

The scansion, which in the beginning was a lesson in itself, now takes but a few minutes in the preparation. Each pupil is called upon to scan and read several lines, and happy is he who gets the lines he wishes.

The object in translation is not to find English equivalents for Latin words, but to put into the best possible English, the thought expressed in the Latin without materially departing from the text.

Quite frequently the class is asked to express an opinion in regard to some part of the story. Many varied and diverse answers are given. Some are inclined to sympathize with the hero and others take the part of the ill-fated queen and scorn the pious Trojan.

Many parts of the Æneid, especially the fourth book, are exceedingly romantic.

The scene of the storm and refuge, in which the crafty Juno contrives to effect a marriage between the Trojan hero and her favorite, is awful in its grandeur and intensity. The fervency of her love, the fierce hatred to which his perfidy changes it, and the curses which she utters against him who has scorned her, are not incomprehensible to us; for they touch feelings and tendencies of the human heart, which are deep-seated and fundamental.

The time of most dread to the class is that

of sight translation, when every member trembles as he thinks the next turn may be his. The teacher, however, thinks this the best of all drills, to which the pupils reluctantly assent.

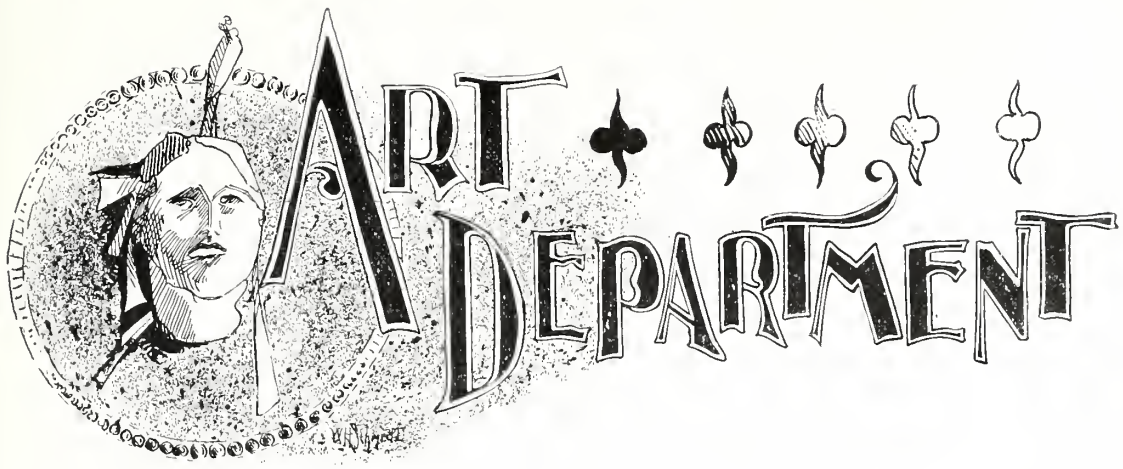
The question often arises as to what good the study of Latin does, and many persons doubt its benefit. But he who has entered it with the right spirit feels that nothing is of greater value. It gives a wide knowledge of the world's life and history; it furnishes an insight into the beliefs and customs of the classic age, and the character of its people; it also brings that refinement and culture which the study of any great masterpiece ever must bring.

In addition to this, Latin is a valuable aid in the study of English, as almost half our words are derived from Latin roots. The study of this language, which is much more accurate than our own, furnishes an excellent drill in the concise and accurate expression of English, since there is constant practice in rendering its idioms in clear and polished English, and care and judgment are required in the choice of words to express the exact thought and to avoid awkward repetitions.

Aside from these incidental benefits, the chief reason for studying Latin is that which is gained from the Latin itself. Barring the pleasure which it gives one, the study of Latin is as efficient as that of mathematics in developing the mental power and promoting clear and sound reasoning, while no other subject plays so important a part in training and strengthening the memory.

KATIE KIEFER.

SEWING ROOM.




## MT. ETNA.

[From Virgil's "Æneid," Book III, 570-582.]

Close to the roaring Charybdis and all its dang'rous surroundings
Shores of the workmen of Vulcan lie low 'midst their turbulent neighbors.
Here is a peaceful port far from the access of wind storms,
While in the distance Mt. Etna groans in crashing convulsions;
At times it sends forth clouds wreathed in absolute blackness,
And glowing balls of fire which kiss the stars in the heavens.
Then, after brief recreation, it bursts forth again with great splendor,
And, in its thundering upheaval and tumult of angry destruction,
Rocks and melted lava are cast to the earth in their ruin
Till the huge mass of the mountain seems boiling from 'neath its foundation.
Here, from report of the ancients, entombed by the missile of great Jove,
Lies the large frame of a giant coiled round in the furnace of cinders,
While lofty Etna, enraged, breathes forth dark smoke from its nostrils,
Veiling the face of the heavens and making it droop in its sadness.
Then in its loud fits of laughter it quakes both the land and the ocean,
Passing a farewell greeting before it in silence reposes.

JOHN F. ENGELKE.

## FREE-HAND DRAWING.

THE drawing department is splendidly located. It occupies three rooms on the second floor of the technical building, taking in the whole northwest wing.

The north room is for the beginners. It is well lighted by five large windows on the north and two on the west, all equipped with shades.

This room is splendidly furnished. There are a multitude of casts, most of which are of the simple kind, such as beginners would use. At this season of the year, however, natural plants and flowers take the place of casts; studies in nature being preferred even to our fine models.

On the walls hang the drawings and paintings of the pupils. They serve as decoration, and at the same time show the visitor the character and excellence of the work done.

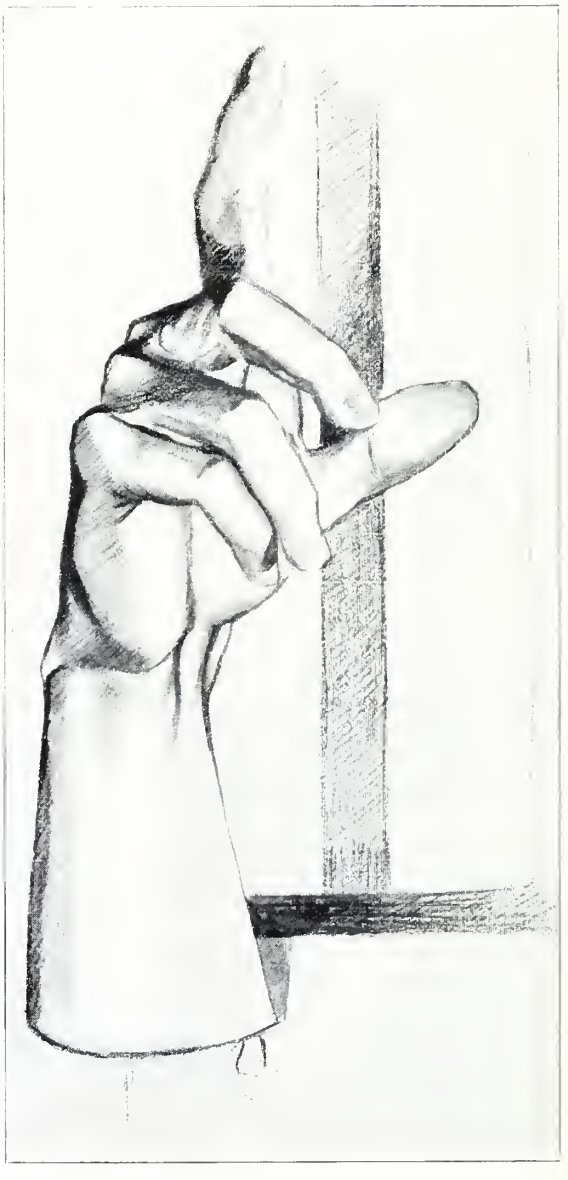
Across the hall, on the south side, is the room for advanced students. The thing that strikes one most forcibly on entering this room is the profusion of casts. Although there are so many, they have been placed with great care and taste, and

the room has a genuinely artistic appearance.

These casts, scattered about so profusely, represent the best in ancient and modern

art. The Winged Victory stands high over our heads, as if in triumph, with one foot slightly forward, her draperies floating about her, her whole form instinct with life and grace. There is Donatello's Madonna, with the sweet, sad face; the beautiful Venus; Michael Angelos' Moses, a majestic head with high, noble brow and face, half hidden by the long beard. There are the wonderful Greek statues, the Dying Gladiator, Hercules, Discobolus and others, embodying the Greek ideal of a perfect human form. Our collection of casts, both in number and artistic finish, are said to surpass those of most schools.

In this room, where there are the more difficult studies, the arrangements for light



must, of a necessity, be nearly perfect; double shades, one set rolling up, the other down, are placed at the windows which face the south and west. There are also large wooden screens, which may be so stationed that all the light will fall from one direction upon the object studied. This is of great convenience to the student.

The exercises in drawing are not confined to one class of work. Charcoal, pencil, pen and ink drawing and water-color painting are taught, and many pupils take advantage of the opportunities offered in all branches of the work.

The drawings hanging on the walls of these two rooms speak for themselves. They show careful and conscientious study, yet they do not lack life and individuality, which is the chief charm of free-hand drawing.

This individuality in the work is the result of the freedom allowed the pupils. They are not hampered by minute directions. The main object is first to get accurate general outlines of the object, as a whole, and then the student has freedom in his method of treatment.

This latitude delights the pupils, and they work eagerly; and, as no two people do the same thing in the same way, each drawing has a distinct individuality.

All this pleases the pupils and makes the work more interesting for them. They hurry to their work, and would linger when compelled to leave it.

Drawing and painting are, at all times, attractive studies, but when the usual features are combined with such truly excellent advantages as those of I. T. S., they are doubly so.

KATHERINE SHAW.

# SCIENTIFIC DEPARTMENT

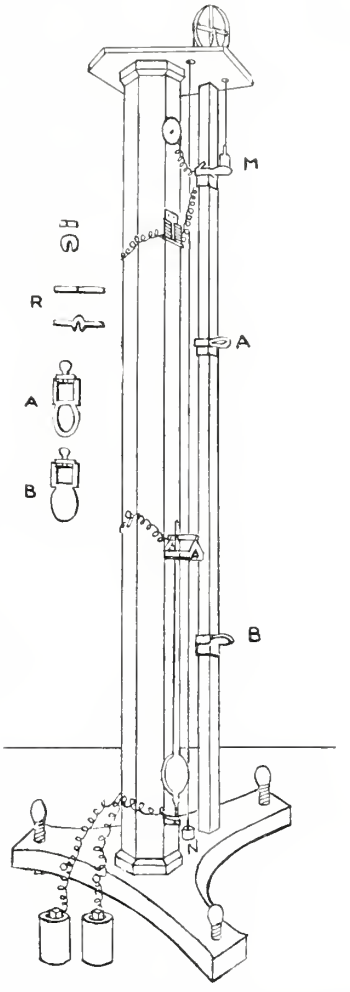
## THE ATWOOD MACHINE.

WHEN a body is allowed to fall freely under the action of gravity, its velocity soon becomes so great that it can not be measured. Various arrangements have been devised to remove this difficulty.

Galileo observed the motion of a ball rolling down a groove in a smooth inclined plane. He made a series of marks along the groove at distances represented by 1, 4, 9, 16 and so on from the starting point, and found that these marks were passed by the ball at times 1, 2, 3, 4; that is, that the distance traversed was proportional to the square of the time. Thus the acceleration was constant.

The same end, the reduction of the velocity to a measurable amount, is attained by the use of Atwood's machine.

This apparatus, which affords great facilities for illustrating the effects of force in producing motion, consists essentially of a very freely moving pulley over which a fine cord passes. To the ends of this cord are suspended two equal weights, M and N. A small additional weight of flat and elongated form, called a rider, R, is laid upon one of them, which is thus caused to descend with uniform acceleration; and means are provided for suddenly removing this additional weight at any time of its descent, so as to allow the motion to continue onward with uniform velocity.




One of the weights, N, is represented as near the bottom of the supporting pillar, and the other, M, as resting upon a small platform which can be suddenly dropped·

Vertically beneath the platform is a ring, A, large enough to let the weight pass through it, but too small for R. This ring may be shifted either up or down and clamped at any height. Beneath the ring is the stop, B, which may be clamped at any height. The office of A is to intercept R, while that of B is to arrest the descent of M. The upright support, to which both are clamped, is graduated in centimetres. A pendulum, beating seconds, is attached to the machine; and there is an electric arrangement, by means of which the platform may be dropped and a bell rung simultaneously with the beat of the pendulum.

If M denotes each of the two equal weights and m the additional weight, the whole moving mass (neglecting the pulley and cord) is $2M+m$, but the moving force is only the weight of m. The acceleration produced instead of being g (gravity), is only $\frac{m}{2M+m}g$. As m is small in comparison with M, the acceleration is small in comparison with that of a freely falling body, and is brought within the limits of observation.

Denoting the acceleration by A, and using V and S to denote the velocity acquired and space described in time T, we shall have

$$S=Vt$$

and

$$S=\tfrac{1}{2}At^2$$

Each of these formulae is verified by the following experiments:

EXAMPLE I.

To investigate the motion in Atwood's machine after the rider has been removed and show that $S=Vt$ or $V=S/T$.

The mass with the rider was found to have fallen a distance of 12 cm. in one second. Clamping A at this point the following results were obtained:

| TRIAL. | TIME. | SPACE. | $V=\frac{\text{SPACE}}{\text{TIME}}$ |
|---|---|---|---|
| First..... | 1 sec ..... | 30 cm..... | 30 |
| Second..... | 2 sec ..... | 60 cm..... | $\frac{60}{2}=30$ |
| Third..... | 3 sec ..... | 90 cm..... | $\frac{90}{3}=30$ |

It is thus proved that the spaces passed through after the rider is removed are proportional to the times of motion. The ratio of the space traversed to the time of traversing it measures the velocity, and it is further seen that the velocity after the rider has been removed is constant.

EXPERIMENT II.

To verify by means of Atwood's machine the formula, $S=\frac{1}{2}At^2$. The stop B was adjusted so as to measure the space traversed by the weight M and the rider R in 1, 2, 3, 4 and 5 seconds, and the following results were obtained:

| TRIAL. | TIME. | SPACE. | $A=\frac{2s}{t^2}$ |
|---|---|---|---|
| First..... | 1 sec ..... | 6 cm .... | 12 |
| Second..... | 2 sec ..... | 24 cm .... | 12 |
| Third..... | 3 sec ..... | 60 cm .... | 13.3 |
| Fourth..... | 4 sec ..... | 100 cm .... | 13.3 |
| Fifth..... | 5 sec ..... | 172 cm .... | 13.3 |

Thus it is seen that the distances are proportional to the squares of the time; that the acceleration is constant and is obtained by dividing two times the distance by the square of the time.

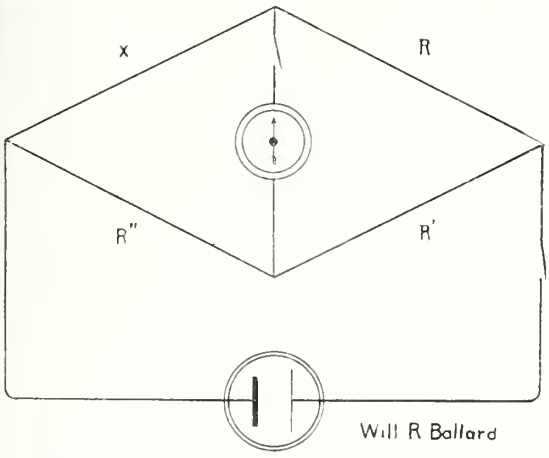
HARRIS H. GUMBINSKY.

## EXPERIMENT VII.

To measure the resistance of a coil of wire by means of the Wheatstone Bridge.

Theory:—If four resistances are connected, as shown in the figure below, and these are of such a value that no current flows through the galvanometer, then

$$R.'x=R.R'' \text{ and } x=\frac{R.R''}{R'}$$




When a current is passed through "C," it divides and goes into the branches "C B A" and "C D A" and then unites at "A" again.

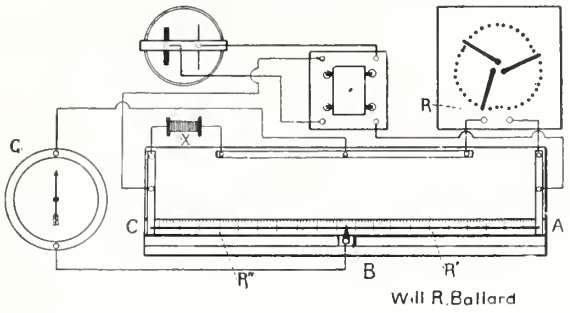
If the potentials at "B" and "D" vary, there will be a current passing from the one of high potential to the one of low potential and the needle of the galvanometer will be deflected. If the potentials are the same, there will be no current passing through the galvanometer.

Then the resistance of "C D" (R), is to the resistance of "C B," (R′) as the resistance of "D A," (x) is to the resistance of "B A," (R″). If three of these quantities of this proportion are known the fourth can easily be found.

The resistance varies as the length of the conductor if the conductor is of the same material and cross-sectional area throughout. Therefore the length of the conductors "C D" and "B C" can be measured, and ("R") is the resistance-box in which the number of ohms of resistance is known. The unknown quantity of ohms of resistance (x) can then be easily determined.

Apparatus:—A gravity cell; resistance spools; known resistance (the resistance-box); Wheatstone Bridge; commutator and connecting wires.

Diagram of the apparatus while in use:




measuring the resistance of a spool of No. 30 German silver wire.

I moved the arm of the resistance-box until I had several ohms of resistance. I put the apparatus in circuit, and then moved "B" along the wire "AC" until there was no deflection in the needle of the galvanometer "G" with a direct or reverse current.

I measured the distance from "B" to "C" and the distance from "B" to "A." The distance "BC" is to the distance "BA" in the same ratio as the resistance "R″" is to the resistance ("R′"). Then I used the proportion $R'' : R' :: x : R$, or the formula $x = \frac{RR''}{R'}$.

I made three different trials in measuring this resistance, each time using a different number of ohms of known resistance. I averaged these results, and thus had the number of ohms of resistance of this coil of wire.

In a like manner I found the resistance of a spool of No. 30 copper wire and a spool of No. 20 copper wire.

Table of results:

German silver No. 30.

| R | R″ | R′ | X |
|---|---|---|---|
| 15 ohms..... | 27.4 | 22.6 | 18.180 |
| 18 " ..... | 25.1 | 24.9 | 18.144 |
| 20 " ..... | 23.8 | 26.2 | 18.160 |

Average, 18.161.

Copper No. 30.

| R | R″ | R′ | X |
|---|---|---|---|
| 2 ohms ..... | 17.6 | 32.4 | 1.086 |
| 4 " ..... | 10.6 | 39.4 | 1.072 |
| 1 " ..... | 25.9 | 24.1 | 1.074 |

Average, 1,077.

Copper No. 20.

| R | R″ | R′ | X |
|---|---|---|---|
| 0.2 ohms ..... | 13.8 | 36.2 | .0762 |
| 0.1 " ..... | 21.6 | 28.4 | .0760 |
| 0.4 " ..... | 8.1 | 41.9 | .0772 |

Average, .0764.

The resistance of the two copper wires varies because their cross-sectional areas vary. The length and material of the two wires are the same.

The resistance of the German silver wire No. 30 and copper wire No. 30 varies because of the difference of material. The length and cross-sectional area of these two are the same.

LENA LESER,
Physics II.

## CHEMISTRY DEPARTMENT.

CHEMISTRY is not a modern science, although in the present century its value and its possibilities have been greatly increased. In the middle ages the alchemist was often regarded as a wizard and was supposed to acquire his skill and knowledge from frequent intercourse with the evil one himself. In this enlightened age, however, in which so many mysterious things are being explained, the wonders of chemistry have been disclosed and this science is no longer associated with evil, but has become a boon to mankind. Every college, yes, almost every high school is now equipped with the apparatus necessary for its study.

Our own I. T. S., being well regulated and quite up to date, is, of course, among the latter. On the third floor in the southeast corner of the building is found the laboratory. It is almost equivalent in size to two ordinary school rooms. An abundance of light is admitted from three sides and the heating and ventilation are perfect. There are six large tables at which twenty-four pupils may work with the greatest convenience; each table having four divisions, and each division being fully equipped. The reagents are arranged in shelves on each desk, the apparatus being stored within. Four large, well-constructed hoods afford means for handling disagreeable or noxious gases. In connection with the experimental work is the quiz which is held in a room adjacent to the laboratory. Here the seats are arranged in tiers to enable the pupils to view any experiment performed by the demonstrator, for whose use a large table is provided. By a system of alternating the classes all the pupils are accommodated daily.

At present there are classes only in chemistry I., II. and III., although if there should be a demand a higher class would be organized. In Division I., which is prescribed, simple experiments are performed in order to give the pupil a general idea of the subject. Cooley's Manual is used. Only the fundamental laws of inorganic chemistry are considered. A minute record of each experiment is kept by the pupil and the equations are solved. This forms the basis for the recitation. The education consists in promoting habits of keen observation as well as accuracy and conciseness of expression. Chemistry II. takes up the subject of qualitative analysis. The student is instructed in the reactions of the common bases and mineral acids. Having completed a list of these reactions, he proceeds to draw up a table of his own for use in determining unknown compounds, and acquires a certain skill in their separation. Much care is taken in solving the chemical problems. The third course treats of quantitative analysis. In this regular recitations are dispensed with and most of the time is

given to laboratory practice. For this work exceedingly delicate instruments are provided, and the student is taught great accuracy. Besides the mental culture received, this course will be beneficial to him in practical work, as he will be able to determine any common base or mineral acid both qualitatively and quantitatively.

Although discoveries in this branch of natural science are constantly being made, our school has not had that honor; nor does it expect to. Good, solid work, however, is required, and as this is accomplished, it is evident that no fault can be found with this department. The results here, as in every other branch, being very satisfactory, the laboratory may also claim a share in the general success of our school.

ALBERT GEORG.

## BOTANY.

WHY did you take botany?" is a question often asked. "Oh, for various reasons," the pupil answers. "Principally to become better acquainted with the ways and doings of nature, and already I begin to see and understand many things which I could not before comprehend."

Again there is the method and the training which we acquire by studying botany. It teaches us to have a definite outline before we do anything, and not to go at our work blindly. It teaches us to observe closely, to have a keen, quick and accurate eye for nice distinctions and differences. It is true that some can see more in a half-mile walk than others in a hundred miles of travel.

Some of the students are taking botany with the purpose of pursuing a higher course at Purdue or elsewhere. Half a year is hardly time enough in which to study botany rightly. Only a good, general knowledge of it can be obtained in one term.

At present there are two classes in botany in the I. T. S. reciting the third and fourth hour p. m. Altogether there are thirty-one pupils. We have three days laboratory work, Monday, Tuesday and Thursday. On these days we carefully examine and analyze different specimens of plants, afterwards sketching them in our drawing books for future study and reference.

We have studied plants with relation to the four great groups of plant life. The Spermatophytes, or seed plants; the Pteridophytes, or ferns; the Bryophytes, and their allies (liverwoorts and mosses), and the Thallophytes. Then we make a study of the seed, its uses and properties, on up through theroots, stem and leaves, until the plant is completed.

On Wednesday, the fourth hour, both classes meet together for lecture. The lectures are generally outlines and directions for the laboratory work. On Friday we have a quiz on laboratory and lecture work.

Besides the regular exercises in classroom, we have long tramps into the woods or in the country for specimens. These are pleasant as well as instructive.

Later on the individual work of each pupil will be to select some flower, analyze it throughly, study and interpret all its parts. Many are impatient for the time to come when they can do this. The violet seems to be a great favorite.

Aside from the practical benefits derived from botany there is a moral one. Through flowers and trees man is brought nearer to his Creator. By them he is influenced to lead a purer and simpler life. The one who does not see the beauty in nature, even though it surrounds him, has something wrong in himself. Most people, however, like to be alone with nature. There is a peaceful consolation in the rustling leaves

and sighing branches which softens the heart and cools the brain. "We love not man the less, but nature more." And what can train us to appreciate this better than botany. With it we not only know that there is beauty in nature, but we can understand it partly.

HOWARD E. BRUCE.

## TWO TRIGONOMETRIC CURVES.

IF from one side of an angle a perpendicular be dropped to the other side, a right triangle is formed. The sine of the given angle is the ratio of the opposite side to the hypotenuse. The tangent of the angle is the ratio of the opposite side to the adjacent one. These are two definitions of fundamentals upon which rest the science of Trigonometry. By the aid of these functions and their relations to each other, the properties of triangles are investigated, and their solutions accomplished.

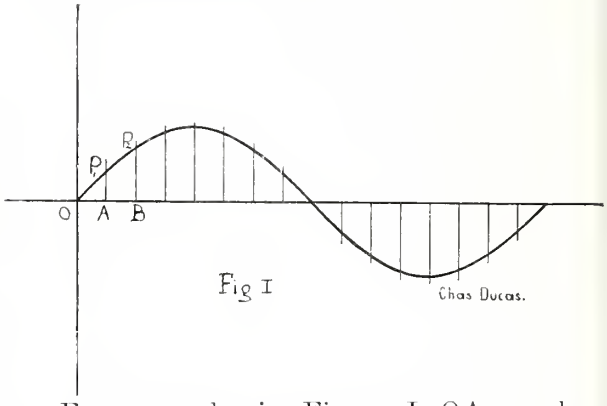
The curves of the sine and of the tangent illustrate well the characters of these functions. The curve of the sine is the path traced by a point moving so as always to satisfy the relation $y=\sin x$, as x assumes all possible values. The curve of tangents is the path traced by a point moving so as always to satisfy the relation $y=\tan x$.

To plot the curve of sines, proceed as follows: Assign to x some value, as, for example, $22\frac{1}{2}°$. The length of the arc intercepted by the sides of this angle in a unit circle is found to be .1963, and the sine of $22\frac{1}{2}°$ to equal .3827.

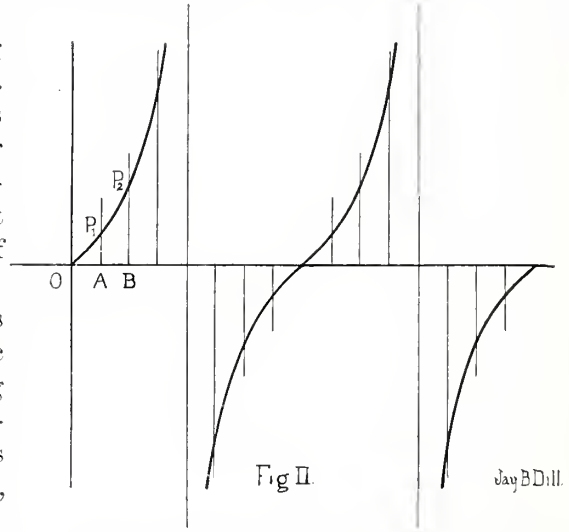
Next assume some other value for x, as 45°, and the length of the intercepted arc is .3927. For the sine the corresponding value is .7071. Proceed in the same manner, assuming for x a number of values lying between 0 and 360°, as, for example, $22\frac{1}{2}°$, 45°, $67\frac{1}{2}°$, and so on.

For the curve of tangents the same plan may be followed — only where before we found the sine of the angle, we must now find the tangent.

Choosing a pair of rectangular axes, proceed to plot the points, whose abscissæ are the values of arcs corresponding to the successive values assumed for x, and whose ordinates are the associated values found for y: that is, for the sine of x.




For example, in Figure I. OA equals .1963; AP equals .3827; OB equals .3927; $BP_2$ equals .7071. Thus we determine the position of a number of points, whose coordinates satisfy the relation $y=\sin x$, and which, therefore, are points in the curve of sines, or sinusoid. Through the points so determined, we now sketch a smooth curve.




For the curve of tangents, Figure II., we proceed in the same manner. OA is, as

before, the length of the arc of $22\frac{1}{2}°$, but AP equals the tangent of $22\frac{1}{2}°$. Similarly for OB and $BP_2$. The coördinates of the points $P_1$, $P_2$, etc., satisfy the equation $y = \tan x$, and hence the curve sketched through them may be fitly called the curve of tangents.

Other values, as 10°, 20°, 30°, and so on, may be assumed for x, and if angles closer together are chosen the curves will be much more accurate.

As it is evident that the values for both the sine and tangent would recur in the same order for each revolution of 360°, the curves representing one revolution will be repeated again and again as the angle approaches infinity.

The curves illustrate the fact that, as the angle increases continuously from 0 to 360°, the numerical values of the sine and tangent vary, and that they sometimes change in character.

Thus, as the angle increases from 0 to 90° the sine increases from 0 to 1; as the angle increases from 90° to 180° the sine decreases from 1 to 0; as the angle increases from 180° to 270° the sine increases numerically from 0 to 1, but its character is negative. In the fourth quadrant it remains negative, and decreases in absolute value from 1 to 0.

Although the tangent also changes in character, and varies in value, the changes are different from those of the sine. As the angle increases from 0 to 90° the tangent varies from 0 to $\infty$; as soon as the angle becomes greater than 90° the tangent becomes negative, and as the angle increases from 90° to 180° the tangent varies from $-\infty$ to 0. As the angle increases from 180° to 270° the tangent varies from 0 to $\infty$. Passing this point its character again becomes negative, and in the last quadrant it assumes consecutively all values lying between $-\infty$ and 0, as the angle assumes all values between 270° and 360°.

We see from the curve of sines that y, that is the sine of x, never becomes greater than + 1, and never less than — 1, but that it assumes all values between + 1 and — 1. In the case of the tangent the changes are much more rapid, as the value of the tangent varies from $-\infty$ to $+\infty$.

It is to be noted that if x is slightly less than 90° its tangent is positive, and large, numerically; but if x becomes only a little greater than 90°, the tangent, still large numerically, is now negative. Thus, while a slight change in the value of an angle will produce only a slight change in its sine, it sometimes produces a great change in the value of its tangent. Hence, for the curve of sines we have a smooth curve, and for the curve of tangents, one with breaks in it.

Ruth Beebe.

## CIVIL GOVERNMENT.

THE study of civil government this term is more interesting than it previously has been. Heretofore a regular text-book, from which several lessons a week were assigned, was used. Now we have two lessons given from a pamphlet, which merely gives hints upon the subjects, and which compels one to do "outside" reading. This method brings variety into the class, and very seldom do the recitations become monotonous. On the day following the evening upon which we have "Senate Meeting," our hour is devoted to reading certain articles which assist us in the general study. Usually one day of the week is given to current topics, and the Friday of every other week is spent in having a "Debate."

One question which was discussed by nearly every one the last "Current Topic

Day" was, "Should street spitting be legislated against?" At the time upon which this subject was discussed, a visitor was present, and, in addition to the statements which we had made, this stranger gave an interesting talk in connection with the topic. By the time the hour had closed every one was fully convinced and nobly held up the affirmative side. These talks are beneficial in that they make us closer readers and observers of the articles which appear in the daily publications.

Laura R. Buehler.

## THE PARK SYSTEM.

AT last, the beginning step has been taken toward making Indianapolis a city of beautiful parks, as well as of beautiful homes and churches.

Visitors to this city invariably express wonder at our poor parks as compared with those in other cities of the same population. This fact has always been a source of mortification and deep regret to the citizens of Indianapolis.

It should, therefore, be a cause for rejoicing that this wide-awake city is to keep pace with others on the question of parks.

Parks are mainly of benefit to the laboring classes, who, as a rule, have no place to stay during the long, hot summer evenings, except in small, sultry rooms, and no place to walk but along the hot pavements which are then giving off the heat of the day. The rich, or at least those who are not poor, can either take a ride to the country in their carriage, enjoying the fresh air, or they can take a refreshing trip on the street car or the bicycle. Now, the very poor people have neither carriage, bicycle nor nickels to spend on the street car.

Therefore, the best way to give them the benefit of the fresh air seems to be the plan likely to be adopted, in expending the park appropriation. The plan is to have several parks, within walking distance, where the laboring man, after a hard day's toil, can enjoy the fresh air for a few hours.

There are many other great benefits to be derived from the parks, too numerous to mention here; but it is certain that Indianapolis has taken one great stride forward.

Allen J. McCorkle.

## ACCOUNTABILITY!

In nature there 's nothing
For which there 's no cause;
The whys and the wherefores
Are always the laws.

The apple fell down
From the tree to the ground,
And then it did roll
Because it was round.

The bubble goes upward
And soars on through space,
Where atoms are running
A chaotic race.

Planets have orbits,
Each track is defined;
Men have but one—Earth—
Despite difference of mind.

Comets, the wanderers,
Go where they choose;
But poets, the dreamers,
Must wait for the muse.

Few men are monarchs,
Yet many 's the tool
In the hands of a stronger,
Whom he suffers to rule.

Can you tell me the reason
Why this should be so?
'T is a secret that 's hidden
Which I 'm anxious to know.

Yet there 's nothing in nature
For which there 's no cause;
The whys and the wherefores
Are always the laws.

Hans O. Stechhan.

## OLD ABE.

"CAB, SIR, any part of the city, cab, sir?" "Take us to 123 —— Street." "It's on the East Side," said my friend. "O, yes, sir, I know where 'tis; git in." He turned, took the blanket off the horse, a big, coal-black animal, not like the general run of cab horses, and patting him on the neck, climbed up to his box. We were soon going at a lively pace, past brilliantly lighted windows, struggling among the throng of hurrying hacks and carriages, until after a drive of twenty or thirty minutes, we reached our destination.

As I paid the fare, I remarked, "you've a long drive back." "O, no, sir; you see we live close by here, and we're goin' home now." Then he carefully placed the blanket on the horse and started down the street, leading him. "Queer old chap," said Chauncy, "I heard him say, 'we'll have rent and feed money after all the bad day, Carl, me boy.'"

'Twas two weeks before I saw our old cab friend again; he recognized me and stopped. "How are you to-day?" "O, fine, sir; but Carl has been sick." "Carl, that's your son, eh?" "O, no, no, Carl's me horse, and a finer fellow you never saw; eh, Carl?" The horse shook his head and raised his ears on hearing his name. "What's the matter with him?" I asked, laughing at such a name for a horse. "I heerd him sneeze; must a ketched cold er something; and I knowed that hoss mustn't leave the stable fer a day er so. He looks sorter pale yet. Whoa, Carl!" The horse had got tired standing so near home, where a good meal awaited him, and with a jerk and a shake of his head, he started in that direction. Old Abe evidently humored him, for his "whoa" had no effect, and presently they turned down an alley not far up the street.

It was getting quite warm; spring was fast giving way to summer's bright blooms in the country and dusty streets in the city. One evening, on coming home from the office, I found some friends had called and were going to stay for tea. Now for a pleasant evening, thought I; but no, it was not yet dark when a messenger brought a note from the senior partner of the firm, saying to come down to the office immediately, as there was important business to be attended to. "Now, the quickest way to arrive there, is to get Abe, if he's home, and then maybe I can get back early," and I hurried toward Abe's.

As I neared the stable, I heard some one inside talking, "Carl, me boy, money for both of us to-day, eh? Essie, pick up that ear of corn under Carl's feet, he's gettin' awful careless with his grub. If he didn't git anymore'n I do sometimes, he'd learn to take better care of it. That's it, put it in his feed box. Why, howdy-do, Mr. Herod, what brings you around here?" I told him my errand. "What, to-night? Well, Carl's worked purty hard to-day, and I don't like to take him out again." "Bosh, Abe, it won't hurt that big fellow." "Well, you see, I think a heap of that hoss, and he don't know 'nough to take keer of hisself, so I has to look out fer him. Well, sence its you, maybe it won't hurt him. I'll take you." As he went to put the harness on, I looked around. A liberal space was partitioned off for the horse by old pieces of carpet being hung like curtains, with a three or four foot space for a door. The floor of the stall was covered with clean, fresh straw, a large bundle of hay lay behind the cab on the other side. "Where do you live, Abe?" "Me? Why, sir, I lives here, that is, upstairs. Take a peep, sir, if you like; there's the stair case." He pointed to a ladder in corner.

I climbed up through the hole, into the gloomy mow. A small part of the loft was partitioned off, and I looked

through the open door of the little room. There was an old cot with a dirty tick, a blanket, and a ragged quilt, a chair without a back, a small stove, a soap-box, and a little piece of carpet spread near the cot. This was the contents of the whole room.

"Abe, whose little girl is this?" "O, she's Mrs. Cale's; she likes Carl, and comes over here a good deal." So his talk went on; first of Carl, then of Essie, till presently, with a "git in," we drove off for the office.

Next Sunday afternoon I strolled down the tracks, and stopped at Abe's. He was currying the horse, in the boiling hot sun. The animal, with his head inside the stable door, quietly munched scraps of hay, while Abe worked and sweated without. "Abe, don't you know you oughtn't to work on Sunday?" He stopped suddenly, casting a half reproachful, half sorrowful glance at me. "Well, sir, Sunday's the only day I has much time; so I always clean the wagon, and slick Carl up a bit—I don't work much." "Don't you ever go to church?" "Why, no sir; 'tain't no use fer me to go to church; I stays to home with Carl."

Something led him to tell me of his past life. His name was Abner Fields; he had lived on the farm until he was almost twenty; then his father had given him a little sum of money, and he had had gone to Chicago, where he fell in with bad company; got to drinking, gambling, and ended up by being sentenced for three years to the penitentiary as a party to a crime of which he knew but little. After his release he had drifted about for several years, and then gone home, but he was told to "git out" by the old folks. For five long years he worked all over the country, first at one thing and then at another; then his mother died, and soon after this, his father. Once more he went home. His father's will left him about two hundred dollars and a young horse. "So with the colt and a little money," as Abe put it, "I come here, and here I've staid; bought me the wagon, and Carl an' me's worked together. Nobody to care for me but Carl and little Essie, and course Mrs. Cale's been good to me—gives me somethin' to eat sometimes when I only got money 'nough to git feed for Carl."

I walked home slowly, determined to help Abe, if possible. As I sat on the porch after lunch, he passed by. He had on a clean shirt, a coat I had never seen him wear before, and his shoes were brushed. "Why Abe, where are you going?" "Thought I'd like to go to church once. S'pose Carl 'l be all right while I'm gone." I wondered at the change in the old man; old—only forty and yet looked to be sixty; his shoulders were bent, his hair and beard were gray, and his step was slow.

Presently I fell asleep in the big porch chair and was only awakened by a passing freight train. I arose, it was almost nine o'clock, and went into the house to retire. Locking the front part of the house, I went upstairs. I had been in my room but a minute, when I heard a call,—I listened, "Fire! fire! fire!" I looked out of a rear window, and there was Abe's stable in flames. I hurried over to it. The shaky old building was almost enveloped in flames. The dry weather had made a regular tinder box of it, consequently it burned like paper. Only a few people were there, the fire companies had not yet arrived. "Where's Abe? He'll be burned to death!" shouted some one. "The door is locked from the outside," said another, "we tried it a bit ago." "Must a caught from the sparks of No. 9, it's been so awful dry."

The fire companies now came upon the scene, but it seemed too late, the little stable was about gone. "Look! who's that rushing down the street?" "Why, it' Abe." And he was yelling at the top of his voice: "Where's Carl, where's Carl,

my poor Carl, he'll be burned." Some one said, "He must be inside," for no one could get in, or didn't dare to. Abe started for the barn, but several men grabbed him; he threw them off like children, rushed up to the burning door, and tore it open with the strength of a madman. The crowd was horror stricken; but before anyone could offer any suggestions, the roof fell in with a crash, just as Abe appeared at the door with Carl. But the horse would not move any farther, and Abe tried to pull him out. Abe stood there but a moment, then he fell backwards, still tightly holding the halter strap. The horse, finding someone pulling back, now started forward, and as he did so, the whole frame quivered and fell in. With a leap the horse bounded through the door, but his faithful owner was left behind. In a short time the fire was put out, and tender hands lifted the body of the old man out of the smoking ruins. He was still holding the burnt end of the halter in his tightly clenched hand. Many a man brushed the tears from his eyes when the story was rehearsed.

Poor Carl was burned so seriously that he soon followed his master. It seemed that my talk to Abe, about church, had caused endless trouble.

"He weren't no saint, but at jedgment
I'd run my chance with Abe
'Longside of some pious gentleman
That looks down on the poor ones God made."

CLAUDE H. COMPTON.

## MANUAL TRAINING.

THE educated man is not the one who knows everything about something, but the one who knows something about everything. Education then is all sided, and to educate a person the school must work toward a development of all the powers of the student.

This is the aim of manual training. It is the hand that confirms or explodes the theories brought to light by the mind. The scientist may know of the advantage to be gained by the use of the lever, but this knowledge does the world no good until the artisan invents a way to apply it to man's need.

A man's work also shows his character and tends to alter it. The honest workman thoroughly fits his pieces together, while the dishonest one apparently does so. Man's thoughts are like his work. The man who shovels dirt seldom thinks of things more elevating than the dirt which he shovels. He has no high aspiration. On the other hand, the trained workman thinks of things above himself, and is interested in things outside of his own occupation. He has some high standard which he strives to attain, and, consequently he is always growing. His advantage over the shoveler lies in his having learned to think while he works. Manual training not only teaches him to do this, but it quickens observation and steadies judgment. Hence, three benefits are derived from the manual training in connection with the regular school work.

The hand should be trained because it is as important a part of the body as is the mind or eyes. It represents the sense of touch, but it serves the other senses also. For instance, a child has no idea of the shape of an object until he has held it in his hands; he becomes familiar with the different forms of surfaces, and, by a combination of these, he is soon able to comprehend the shape of an object without feeling of it. In this case the hand educates the eye. In the case of the blind it takes the place of the eye.

The use of tools should also be taught. They are the gauge of civilization; for, as man becomes more civilized, his needs are more numerous, and, in order to satisfy these, new means must be invented. The savage has but few tools—he needs but few. His equipment is complete if he has a bow and arrow with which to fight or hunt, a spear for fishing purposes, and a few sharp stones to be used in forming these. As he becomes more civilized he has greater needs. He wants a house, and in order to gratify his desire he must have new tools. So without tools man is nothing—he is naked, helpless to defend himself against wild animals. He must live on such roots and shrubs as are at hand. With tools he is everything. He turns the mountains into beautiful dwelling places,

and the forests into fertile fields. The earth yields its iron ore, to be turned into great engines. The ocean, instead of separating him from other men, becomes the medium by which he reaches them. Even the air is imprisoned and used to stop the flying train, and the lightning is made to bear his messages. Hence infinite power is obtained through the use of tools, and for that reason the student is as much benefited by the study of tools as by that of mathematics or medicine. True, he can go into a shop and learn to use tools; he could see what each tool does, but besides this he should know the how and the why of each implement. The Training School teaches this.

The school, it is true, can give only an introduction to the many fields of labor, but this introduction serves to inspire the student. He sees what men have done, and desires to do something himself. There is a special work for him to do, and he has only to find out what that work is, and then do it. The Training School does not turn out thorough mechanics, but it enables the student to see the line of work for which he is best fitted. It gives him a knowledge of science and, right along with this, a knowledge of its application. What is still better, he is taught along literary lines, that the artisan of the future may be elevated and move in good society.

Manual training then, makes the boy think, makes him honest and upright, and causes him to work towards a high standard. It enables him to see his work in the world, that he may begin early to do it; it enables him to become a powerful man. Last of all, it places the artisan on an equal footing with the professional man.

Ed. Haines.

## WOOD-WORKING DEPARTMENT.

THE first course in the mechanical department consists of bench-work. The work-benches are made for two pupils each. While at work the boys face each other. Each half of the bench is supplied with a try-square, gauge, level, rule, hammer, mallet, screw-driver, baeksaw and a bench hook. Each double bench has an oil-stone, a brace, five auger bits, and a pair of dividers. Then each individual pupil is supplied with a Bailey wood-bottom jack plane, a Bailey smoothing plane and four chisels of various sizes.

The exercises which the pupils are given to make consist of laying out, boring, splicing, mortise and tenons, a box, dowel and dove-tail joints and a wall bracket. These teach the fundamentals of cabinet making. After this the pupil makes a project, which is some finished article of use.

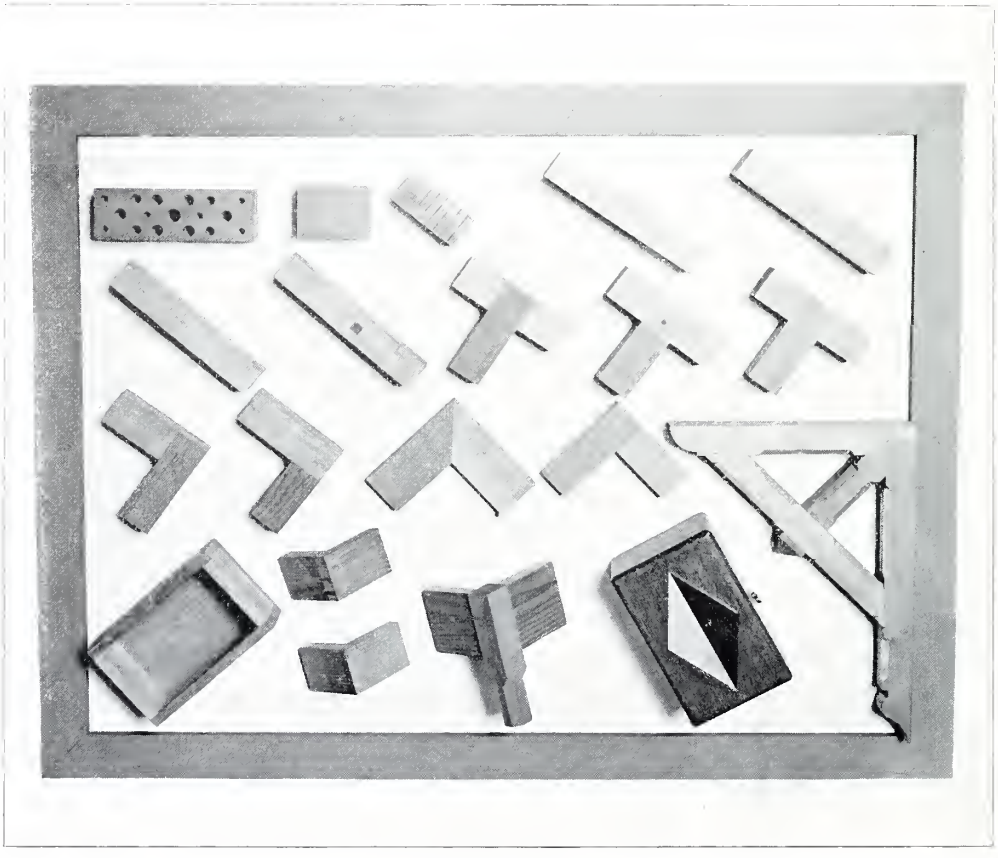
The work described above runs through a half year, after which the pupil takes up wood turning. The equipment for turners and pattern makers is as follows: Eight 8-in. swing, 3-ft. bed lathes; twelve 10-in. swing, 3-ft. bed lathes, and four pattern makers' chuck lathes, capable of swinging from twenty inches to six feet; a cylinder planer, drill press, jig saw, band saw, combined cut-off and rip saw, universal wood worker, and two trimmers. Each single bench is supplied with with a try-square, gauge, rule, hammer, pair of dividers, pair of outside and inside calipers, backsaw, three socket firmer chisels, square end, and round nose turning tool and two planes.

As one stands at the south end of the shop, he sees to the left the carpenter benches of the first year students. To the

right are the lathes and benches for turners and patternmakers, and in the extreme north end are the power machines already mentioned, besides a rack for stock lumber. In the south end is the tool-room, from which pupils are supplied with tools that they do not have at the bench.

Each pupil is responsible for the condition of his tools, and at the end of the working period he must clean up his bench or lathe and put everything away in an orderly manner.

JULIUS HERMAN.



BENCH WORK.

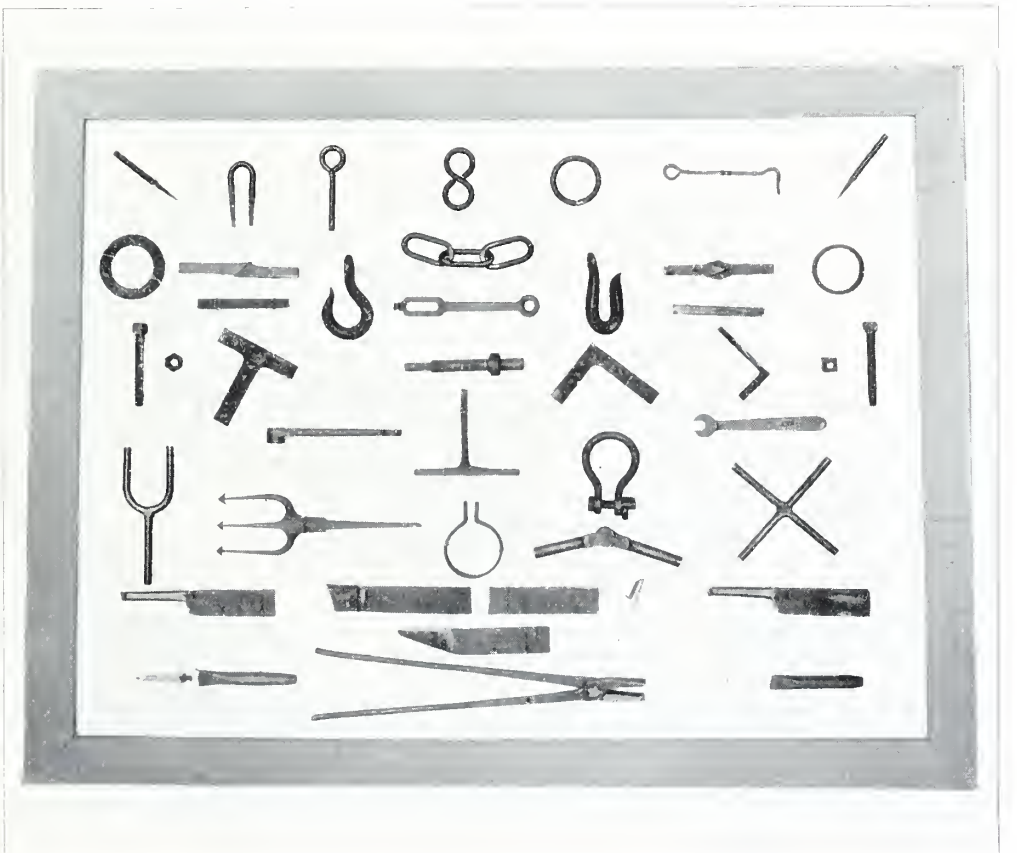
## FORGING.

WHEN a boy enters the forging department he has before him something entirely new, unless he has had experience at the anvil.

In beginning the course each boy is assigned a forge of his own. For the first few days he pounds lead, in order to get accustomed to standing at the anvil properly, and to learn how to use the hand-hammer. Until a boy begins to handle this tool he does not know how clumsy he is. At first he finds difficulty in hitting the lead at all, and invariably digs great notches into it with the corner of his hammer when he does hit it; but after continued practice he is able to strike precisely where he intends to.

The work in lead finished, the boy is given exercises in iron. These, to begin with, are very simple, and gradually grow more difficult, ranging all the way from drawing out a point to forging a fish-gig or an anchor. The two advanced classes are now making a pair of ornamental iron gates.

But a great many people ask, "What is the good of manual training?—what is the use of taking forging; you never expect to be a blacksmith, do you?" That is, in other words, they ask, "What is the use of training the hand to do anything? Why not leave oneself helpless, so far as doing



FORGING.

anything with the hands is concerned, for the reason that he may not intend to become a blacksmith or a carpenter? The absurdity of such a question is self evident.

There is no doubt that the man who can forge a chain will write a better book or preach a better sermon than the man who can not, other things being equal. The fact that many men have succeeded without the manual training department in their education is no argument against it. Many men have succeeded with almost no education at all, but that is not saying that they would not have been better men had they been well educated.

One might ask what is the use of studying algebra, the chances are you will never have any use for it. The answer is plain, it develops the mind. In the same way forging gives the boy a trained eye and hand, for between every two blows that he strikes he must see what the last blow accomplished, what the next should do, and then guide the hammer to the proper place.

Forging develops in many boys a liking for the work and puts them in the way of permanently settling on an honest occupation, when otherwise they might amount to nothing at all. It will be of material value to boys who become civil engineers, architects, and the like, for from it they learn the nature of steel and iron, how it acts under certain conditions, and the danger of poor or burnt material, as well as many other valuable things; and, although it is not claimed that one thoroughly learns a trade in the forging department, yet he is a long way on the road who has mastered what may be learned there.

WILL R. BALLARD.

## PATTERN MAKING.

THE patterns constructed in this department are made of wood, generally pine, and are used for making molds in the foundry.

In general appearance patterns resemble the castings which are made from them. There are, however, several points of difference.

First. Draft. This is an addition to certain parts of the pattern which enables it to be removed from the sand. The allowance for draft is about $\frac{1}{32}$ of an inch increase in width to each inch of height, which makes the pattern slightly wedged-shape.

Second. Core-prints must be added, if there are to be any cores in the mold. These core-prints are added to the patterns, and from the cavities in the mold in which the sand core rests. These core-prints do not appear in the finished casting.

Third. For convenience in molding, the pattern is often made in two pieces.

Fourth. The whole pattern must be made larger than the desired casting on account of the shrinkage of the iron in cooling. This shrinkage is known to be, for iron, about $\frac{1}{8}$ of an inch to the foot, and for convenience the rules used in pattern making are made with this addition.

In making patterns all of these things must be taken into consideration. The pupil must know exactly how his work is to go into the sand, and he must be sure that it will come out again. There must be no corners in the pattern which will leave sharp projections of sand in the mold

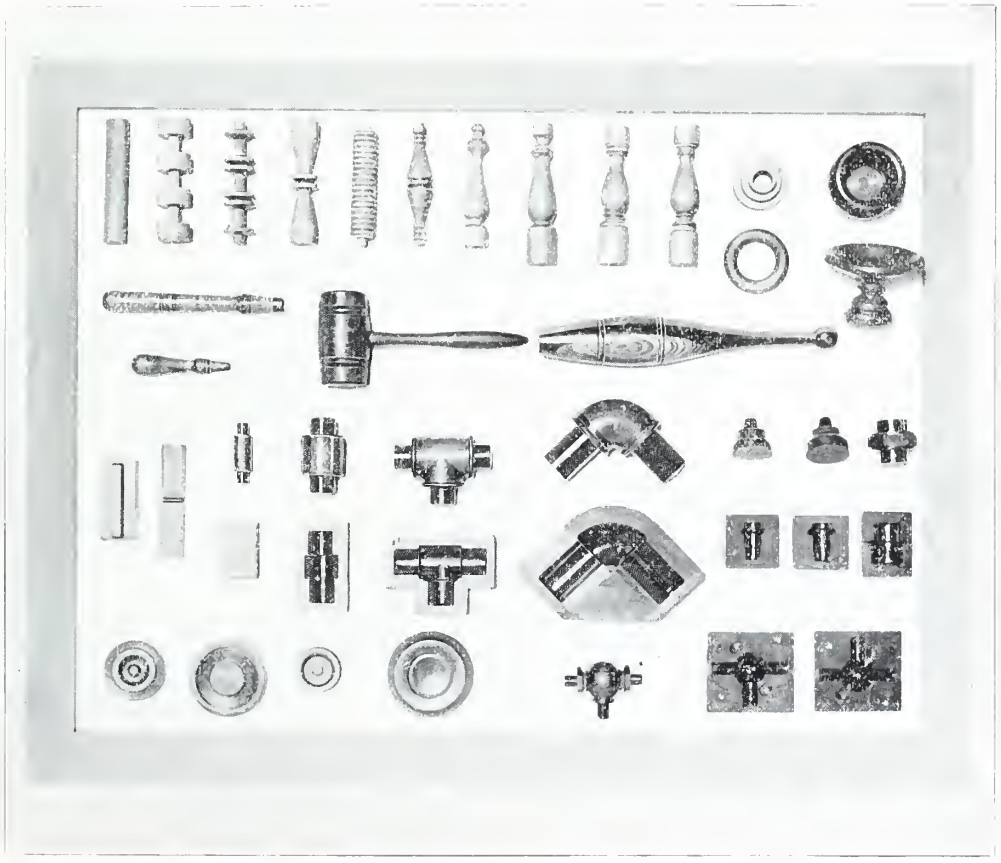
as the hot iron would break them off and spoil the casting

Sometimes after a difficult pattern has been completed it proves to be utterly worthless because some of these small details have been overlooked. The mistake most frequently made is the omission of draft. Occasionally, also, the draft is put on in a manner which hinders instead of helps in removing the pattern from the sand. There is, undoubtedly, good mental development in this mind picturing of the work as it is to be used in the foundry. Sometimes an entire day's work will consist simply in planning the patterns.

The first work in pattern making is of the simplest kind and grows more difficult as the course advances.

In this work the pupils feel for the first time that the things which they make are of some practical value. The bench-work and wood-turning are given up almost entirely to exercises which teach the pupil how to handle their tools, but which have no intrinsic value.

In the first half-year each pupil makes a pattern for a square bar, a hollow cylinder, a pipe coupling and a tee-pipe fitting. After these are finished the boys are put on different kinds of work. Probably the



WOOD TURNING AND FIRST HALF YEAR'S WORK IN PATTERN MAKING.

most difficult work in the first half-year is the quarter-turn. All of the boys, however, do not make this.

The patterns mentioned above, with the exception of the first, require core-boxes. These core-boxes are quite as hard to make as the patterns themselves. They are usually made of several pieces glued together, a new piece being used whenever the size of the core changes. The core-boxes correspond to the inside of a hollow casting, and the cores which are made in the boxes are just the reverse of the cavity.

Aside from the exercises which have been mentioned more difficult patterns are made. The advance class is making patterns for a twenty-five horse-power stationary engine. They are also making patterns for a traveling crane which will be used in the foundry. Some of these patterns, especially wheels and pulleys, are quite difficult and require a great deal of time in making.

FELIX F. BALLARD.

THE FOUNDRY.

## THE FOUNDRY.

ONE of the most interesting, as well as instructive, departments of the technical building is the foundry.

It requires one year to complete the course in this department. On entering the first half year's work, the student is taught the general principles of foundry practice. He is required to mold the exercise pat-

terns made by himself in the pattern shop, and as he becomes proficient in his work he is given more difficult and intricate patterns to mold.

Core work is next taken up, and the pupil is taught that whenever a hole or cavity is wanted in a casting, a core of sand of that size and shape must be used in the mold. For dry or baked sand cores our new core oven is used. We have an excellent oven, one that will rival Miss Vail's range, as a baker.

The first pouring or casting that is done is with lead, which gives a fair idea of the action of liquid metal and what may be expected when iron is used.

The routine of shop work is relieved by lectures delivered by Mr. Cox. These are very interesting, and are given so that the pupil will have a better and clearer idea of the theory and methods of foundry practice.

The class, under the guidance of the instructor, makes visits to the larger foundries of the city; here they see the work carried on on a large scale and are able, by close observation, to gain an insight into work much larger than the school foundry is capable of doing

During the second half year most of the "runs" are made; they are the most interesting part of the foundry work, and are enjoyed by all. The advanced classes in pattern work make complete sets of patterns for some one machine or machines. From these patterns castings are made by the advanced foundry classes, the successful castings being sent into the machine shop to be finished.

In this way the foundry works hand in hand with the other branches of the technical department. RALPH HILLIKER.

## THE MACHINE FITTING ROOM.

THE final touching up of our mechanical course is given in the machine fitting room. In the shop we have eight different kinds of machines, and each boy in the class before the year is over makes certain exercises that call into use these different machines.

The lathes are used more than any of the other machines, and for this reason we have seven lathes of three different patterns. As the machine fitting department grows larger more lathes will have to be added.

On being assigned work at a machine, the duty of the student is, first, to study the machine and find out all he possibly can about it, and make himself thoroughly acquainted with the different movements. When we first look at the machine to which we are assigned it appears to be nothing but mass of iron and steel fastened together, but upon examining it more closely, and by throwing in the gear and turning a screw here and there, we make the machine a living thing.

The lathe exercises are such as to make us acquainted with the different tools, taper-turning, boring, thread-cutting, etc.

The planer is an interesting machine. The bed, which has the work fastened to it, moves slowly forward while the tool does its work, and then quickly returns ready for another cut. In watching the belts shift from one pulley to another and the different feed screws adjusting themselves at every cut the tool makes it would seem that a man were inside causing the different changes.

Next is the shaper, which runs much on the same order as the planer, the difference

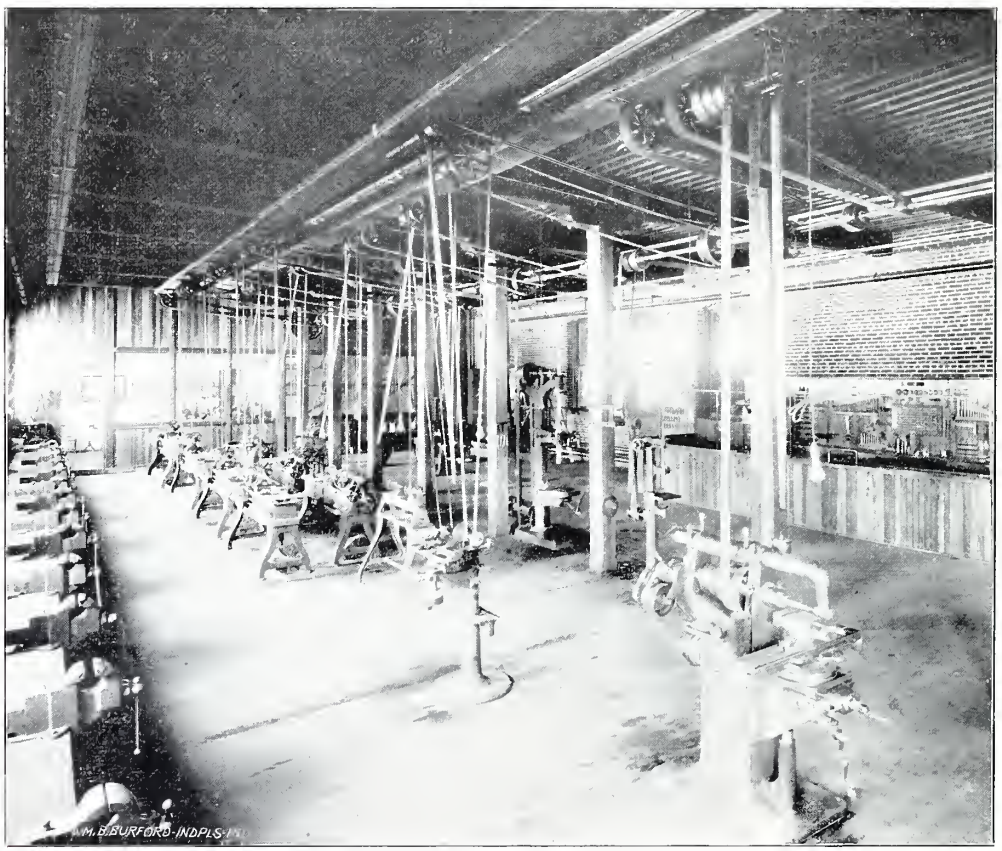
being that in this machine the tool moves along the work instead of the work moving along the tool.

We have two different drill presses, a large one and a small one, with which any sized hole required can be drilled. The cutter and reamer grinder is a small machine on which are ground cutters, reamers, gauges and other tools that must be accurately finished. For example, in making a standard internal and external cylindrical gauge it is possible to grind them so accurately on this machine that if the internal gauge is held in the hand the heat thereof will cause it to expand so that it will not fit the external gauge.

At one side of the shop is the tool-room, where all the small tools are kept. Each boy is numbered and has four checks to his credit. When a tool is taken from the tool-room the keeper places one of the boy's checks in place of the tool, and in this way everything is accounted for. The boys take their turn in the tool-room and serve a week at a time.

The present class has been the first in every shop, and has helped to get each one in order; therefore all the boys feel that they have been greatly benefited by this experience.

M. J. Traub.



MACHINE FITTING ROOM.

## MECHANICAL DRAWING.

MECHANICAL drawing is an important branch of the mechanical course. It is necessary because the boy in the shop works from a plan, therefore he must know something of the construction and meaning of such a drawing.

Two well equipped and well lighted rooms are provided for those who take this course. Each pupil is assigned to an adjustable stand which is fitted with several small drawers in which tools, such as ink, triangles, scales and pencils are kept. Drawing paper is provided at a small cost to the pupil, and drawing instruments and models are furnished by the school.

In the first half-year of drawing, the pupil is taught how to make the different kinds of lines and where to use them. Lettering and ornamental drawings are also taken up in this connection. The time of the second half-year is spent chiefly upon projection work, that is, drawing the front, top and side views of objects, such as pulleys, boxes and machine parts. Some time is also spent on section drawing.

During the third year, the work becomes more difficult, and it requires much more thought to make a drawing. The first half of this work deals with the intersections of solids and the development of their surfaces. Say, for example, that two square pyramids intersect at right angles, front, side and top views would be drawn showing lines in which the two surfaces meet.

The last half of the third year is devoted to a short course of descriptive geometry, followed by its applications in drawings of roof construction and shadow work in both ink and color shading.

The work in the first half of the fourth year begins with isometric drawing and merges into mechanical architectural perspective. This latter consists of views of houses and bridges, such as an architect or engineer would present before the structure is built.

The parts of machinery are studied in the last half-year, and this is probably the most interesting work of the course. The drawing of lines, curved, dotted and dashed in all the course preceding prepares us for the more difficult drawing of a complex machine. In this way the student has a review of former work and a chance to apply it in making something practical.

But this is not all the good derived from drawing. As the pupil applies the rules and uses the different methods his mind is being trained to think correctly and his fingers to work accurately. Such training as this makes the education complete, for the hand becomes one of the mind's most faithful servants and is prepared to act at its bidding without error.

HARRY MUNSELL.

## COOKERY.

THE I. T. S. is of especial interest because of its devotion to instruction in the industrial arts. This is shown by the number of visitors who are never satisfied until they have seen the girls in their white caps and aprons at work in the "culinary department."

This work is as interesting as valuable to those who are members of the class. Theory and practice are combined in the work, the one asking the *why*, the other the *how*. Which is of most importance? I fear to ask. I am sure there is one class of mankind who would wish to do away with theory; only the *how* is the one important thing for them. But we soon find that many mistakes and failures occur when the *why* is completely ignored by the *how*.

There are certain elements necessary to our food, and these we learn in the study of the food principles. The whole course is carefully planned and arranged that this fundamental work in the science of cooking may be studied from the first day of the session. There is no thought, no feeling, no motion, but is accompanied by the destruction of cells either of body or mind. Repair for all waste, material to build up the tissues and give us energy — indeed, everything must be supplied by our food. To teach us the right kinds and proportions of these food elements is the object in our work on food principles.

One of the important lessons in our study of cooking is that of economy and the "detriment of unmeaning waste."

"Failure" is almost an unknown word in the laboratory, but occasionally an "inexperienced cook" puts powdered sugar in cake instead of baking powder, or another woefully forgets that it is baking powder that makes our biscuits light. But "experience is a dear as well as effective teacher," and the failure makes one more thoughtful in the future.

For some time we have been devoting one lesson a week to dinner work, that is, learning how to prepare and serve a course dinner. We all enjoy the time thus spent most heartily, especially on the days when we are guests and have no work to do but that of imagining three courses and "discussing" the other two with a relish born of real experience in cooking. But this dinner work is not all fun by any means; we receive a great many practical lessons. While we already knew some of these things, we honestly confessed that some were new to us.

This latter truth was "self-evident." The blunders made, the questions asked, and the prompting that was done during the first lessons were as numerous as laughable. But we hope by the time the course is completed we will have a better knowledge of at least how to arrange a table and to serve a pretty home dinner. Even if not expert in the art of preparing food—such perfection will only come with practice—we learn to be careful and are made to think.

From all this it can be seen that cooking is not mere "child's play;" it is not the making of "dainty little cakes" and "cute little pies." Yet it is a pleasant work; it is the study of an art and science that the world can not do without, for "civilized man can not live without cooks," that is, good ones.

Bessie White.

## THE SEWING DEPARTMENT.

Probably visitors and many pupils of the school who pass through the sewing room, and see the girls sitting at the tables or machines with garment work in their hands, are not aware of the other interesting work done by the class.

One day is set apart for quotations, when each girl is expected to give at least one quotation pertaining in some way to our work. It is indeed interesting to hear the various selections on spinning, the wheel, silks, and so forth, and to know that even the greatest poets were inspired to write beautiful poetry on these seemingly ordinary subjects. On our last quotation day we enjoyed the recitation of several poems, also a history of the spinning wheel, and an article on the revival of the use of the wheel in society.

Lessons on wool, cotton, linen, silk and needles are scattered throughout the term. Carefully prepared papers on the raw material and the various stages of its manufacture are read. We have also microscopic lessons, in which the fibers of wool, cotton, silk and linen are carefully examined and compared.

Talks on purchasing, which teach us the value and quality of material, are of great benefit to those girls who have never paid any attention to this subject before.

One of the most interesting and beautiful lessons of the course is the one on color and harmonic blending of colors. The different nations show their taste and character in their choice of colors. How very great is the contrast between the rich red and yellow of the Turks, and the bright, many-colored robes of the Chinese and Japanese, yet each is artistic in its place.

Of the many shades and tints of the seven original colors, we are given an idea as to which blend and harmonize. In their dainty light summer dresses which the girls make, they show their individual taste and knowledge of harmony. A very delicate pink has been chosen as the sewing room color, so those who, on visitors' day, see the room decorated with pink, may know its significance.

The girls have a chance of showing their originality in composition in sewing, as well as in other subjects, for a description of each model and garment, as it is finished, has to be written in the model book.

Sewing, as a whole, is a very practical subject, and one which will be of use to the girls ever after.

Mabel Florence Bryce.

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## HYGIENE AND HOME NURSING.

A KNOWLEDGE of hygiene and home nursing is very valuable, especially to the young women. It is they who are more often called to assist in cases of illness.

The course includes a review of physiology, a course in emergency work and a thorough explanation of a nurse's duties. Then comes the care of infants, and last invalid cookery. After this work had been taken many girls resolved to become trained nurses.

The review of physiology was very beneficial to all. It is gratifying to know how our bodies are constructed. The heart and lungs of a calf were dissected, and from them we obtained a splendid idea of the human heart. We found the walls of the left side of the heart were thicker and stronger than the right, because it has to force the blood all over the body. For this reason the heart lies a little to the left of the middle of the body, but not on the left side, as we supposed. A drop of fresh blood was examined under a microscope, and any number of red corpuscles were seen singly and in rows, but we could find no white corpuscles. For study of muscles we had an excellent example in the muscles and tendons of a chicken's leg. All were surprised at the way in which they were constructed and placed, layer upon layer.

Emergency work is just what its name implies—what to do before the doctor comes. The uses of the triangular or the true emergency bandage and the roller bandages were shown on a little boy, who kindly consented to be our patient. Each girl was required to show that she understood their uses by practicing on her classmates.

In the study of fractures we found that such things as boards, umbrellas and sticks and straw could be used for splints, cotton or anything soft for padding, if the patient had to be moved. But if he had only to be made comfortable we would disturb him as little as possible before the doctor came.

In the emergency work came the restoring of the apparently drowned. Here the patient lacks oxygen and heat. The former can be restored by artificial respiration and the latter by friction.

We found that some things in daily use in our kitchens are the best antidotes for

poisons. When the poison is an acid, baking soda, soap suds, tooth powder, or even plastering scraped from a wall, are very effectual. Baking soda is also most useful for a burn. Vinegar and salt are good antiseptics—that is, we can use them in water to dress a wound. They will benumb the disease germs that so often get into a wound and keep it from healing.

One thing of great importance in invalid work is the making of poultices. A poultice to be beneficial must be hot and not too stiff. We girls went into the kitchen and without assistance made a poultice and did everything but put it on the patient.

Another important practical lesson was the making of an invalid's bed and changing it with the least possible disturbance to the patient.

In the infancy work we learned much that was new to us about the little folks. We can better divine their needs. Every baby of our acquaintance has an added interest for us.

One of the duties a nurse has to perform is to care for her patient's appetite. Many dainty, tempting dishes were prepared under our eyes, and we tasted them with a relish. Others are more substantial, but not so pleasant to take.

When we sum up all the knowledge acquired in the half year's work, we can see how useful it is in our daily lives. We better understand ourselves and can do our work much better and help others to do theirs.

BERTHA J. BORST.

## BOOK-KEEPING.

"LEARN TO DO BY DOING."

THIS department proves to be a source of interest to visitors, and especially to all friends of progress along the line of practical education. The aim of the teacher and the character of the work is to assist the students in a natural way by removing one obstacle at a time in the order that it arises, instead of requiring us to commit definitions and memorize customs and usages without reference to their application to our daily life.

The result of each transaction, whether it be a success or a failure, is carefully noted. By this method many difficulties are cleared away in such a manner that the pupils feel warranted in claiming for themselves a greater degree of perfection, in the knowledge of book-keeping, than could otherwise be obtained.

Goods are bought and sold daily by giving and receiving checks payable in college currency. After a time the paper cards representing the merchandise lose their insignificance and the students soon learn to look upon their stock of goods with pride. It is a common occurrence for some one to be called upon to pay the same note twice, or a check in which the amount has been raised. The teacher provides these snares to teach the pupils carefulness and accuracy.

Of course each student thinks he will never be guilty of making a mistake and get caught, but alas, there comes a day when egotism becomes a thing of the past, and with one accord, all join one another in saying experience is the best of teachers.

Three days of the week are devoted to book-keeping. During the first and second years more time is given to penmanship, but in the third and fourth years it is dropped, from the fact that book-keeping becomes more complicated and consequently requires more time.

On Thursday we study commercial law. Each lesson grows more interesting as the rules and principles that govern the great business world are unfolded. Friday is "qu z-day." Then it is, we find to our astonishment, how little we know about the

great science so full of complexities, yet so necessary and beneficial to the business welfare of a nation. There is a question box which is opened every two weeks. Each one failing to answer when called upon secretly wishes he knew the person that asked such hard things. However, this information is denied us, and we must do the best we can.

History is silent in regard to the origin of book-keeping. No one man or nation has the honor of being the author of a science which governs the thrones of commercial empires and guides the financial affairs of the world. Like language and government, it is the product of evolution.

It was evolved through the multiplied intercourse of man with man, from the simplest principles of personal obligations, into a system of personal debits and credits, or single entry system. Then from this form, through the necessities of extended and constantly increasing commerce, was developed the double entry system of the present time.

"Book-keeping is an art which no condition of life can render useless. It contributes to the advancement of all who buy or sell, of all who wish to keep or improve their possessions, and of all who desire to be wise. No man should enter into business while he is ignorant of the method of regulating books."

B. Mabel White.

## STENOGRAPHY.

STENOGRAPHY is one of the interesting subjects that can be chosen at the Industrial Training School. There is something fascinating about it; even the most discouraged pupil will struggle on and try to conquer the difficulties.

Many people wonder what benefit it is to us. They think this study would be very well if we intended it as a profession in life; but add that all of us can not do so, for if we do, Indianapolis will have more stenographers than she can supply with work. However, few intend to use it as a means of livlihood, yet in studying it they have not wasted their time. Whence comes that excellent memory which some possess? Is it not from just such a study as stenography? A study that necessitates a complete concentration of mind in order to be mastered. Stenography tends to accuracy of pronunciation, for, in order to write correct outlines and place the proper vowels, you must have at least some knowledge of pronunciation.

Every day we come across new words in our lessons, words which we are taught to use as they should be used. So we constantly increase the size of our vocabulary.

Also, it might be said to help us in our other studies, for in taking notes we can use shorthand and finish in advance of the others.

It is not so difficult now, but at first it was so discouraging. We were taught the outlines and placing of the vowels and made many ludicrous mistakes.

However, we conquered the difficulties with the help of a patient teacher, and entered successively the second and third year classes where we were chiefly taught abbreviations and the use of the hooks. Now we are finishing the work and spend most of our time in reviewing and practicing for speed. Some one dictates while we write, and as the dictation is often read as swiftly as possible, we have hard work in keeping up and often stop in despair. However, practicing is necessary, for when we finish this June, we must be able to write at least one hundred and fifty words a minute, not an easy task.

Mamie Jolly.

## ATHLETIC ASSOCIATION.

JOHN GOODE.....President.
WILBUR MCINTOSH.....Vice-President.
ED. BUSCHER.....Secretary.
MORTON TRAUB.....Treasurer.

OUR Athletic Association originated two years ago under unfavorable circumstances, as the boys lacked confidence in their own ability, but we now have a prosperous institution.

We supported our baseball and football teams in such a successful manner that the boys soon saw that the association was a desirable thing.

This year we have furnished the baseball team with balls, bats, gloves, etc., and we hope that the team will be as good as last year's.

We are now making preparations for a field day, to take place about the last Saturday in May, at the State Fair Grounds.

The principal features of the program to be followed, will be running and bicycle races, throwing the hammer, putting the shot, pole vault, high and broad jump, high kick and throwing the base ball.

A number of valuable prizes will be awarded the winners in the various events, they being presented by different business firms of the city.

In every athletic sport attempted by our school we have defeated the High School; and in baseball we have been successful in defeating Franklin and Butler College, as well as many other first-class amateur teams.

Our school is composed of students who are fond of manual labor, therefore we have many strong, athletic boys who will help to make an interesting field day.

Any student of the I. T. S. may be a member of the Athletic Association, the dues being very moderate.

Every one who desires to take part in our field day must be a member of the association, and must pay a small entrance fee, for every event in which he takes part.

It is the duty of each student in our school to take an interest in this association, and to help us, by attending our first annual field day. JOHN GOODE.

Rik-a-ty-x, co-x, co-x!
Rik-a-ty-x, co-x, co-x!
How-do-you-do!
Bul-ly-for-you!
Training-school!

The following is the record of the Training School's '96 football team:

I. H. S., 0, *vs.* I. T. S., 18.

I. H. S., 0, *vs.* I. T. S., 22.

Franklin College, 4, *vs.* I. T. S., 0.

Purdue University, 18, *vs.* I. T. S., 0.

The team was captained by Frank Queisser and managed by Mr. Harry Cox. Mr. Robert Reinhart, a member of the I. L. A. football team was coach, developing the boys considerably.

Looking back over the brilliant record of our baseball team of last year, we have just reasons for expecting to win a majority of the games this year. The team is made up of good fielders and reliable hitters, who are captained by Walter Bronson. Games have been scheduled with the U. of I., Purdue, Wabash, Rose Polytechnic and Earlham. From this you will see that the Red and White has some hard battles to fight; and we are confident that it can take care of itself.

## THE SENIOR READING CLUB.

THE Senior Reading Club of the I. T. S., as its name signifies, consists of twelfth year pupils and post graduates who are desirous of extending their work in English literature beyond the introduction obtained in the English department of the school. Heretofore the club has considered only one work during a term. "Les Miserables," "Daniel Deronda" and the "Newcomes" were studied; then it became a Shakespeare class, and "Macbeth" was read; but the plan of work for this term covers a broader field. It deals with modern literature, beginning at that important period when the French Revolution was shaking all Europe with the might of its revolutionary spirit. English literature, during the early part of the seventeen hundreds, was hollow and artificial, as void of sympathy with humanity as were the Bourbons of charity for the people. But Wordsworth, Coleridge, Southey and many more, sharing the common feeling of tenderness for struggling humanity in France, voiced a new spirit. They gave to the world a literature permeated with a new sympathy for suffering and a genuine love for nature. It was the same spirit which Carlyle, a little later, held when he wrote, "to come back to reality, to stand upon things, and not upon the show of things."

The class felt the need of a more intimate acquaintance with this, the beginning of modern literature. So, under the guidance of Miss Demree, and with Henry D. Pancoast as chief authority, Scott, Byron and Lamb have been reviewed. Coleridge has been read more thoroughly. After a study of his life, "Kubla Khan," "Christabel" and "The Rhyme of the Ancietn Mariner" were studied. During the study of the "Ancient Mariner" the class was fortunate in having an edition of the poem, with illustrations by Doré, which helped us to appreciate the horror and mystery of Coleridge's descriptions. Thus we intend to proceed with Shelley, Keats, Macauley, and so on, as far as possible in such limited time.

The members, and teacher as well, did not feel satisfied with the plan of work, for, while studying those who gave character to early modern literature, we are in ignorance of many men and women who are making the literature of the close of this century. Therefore, in order to cover as much of the century as possible, a part of the time each week is devoted to a conversation, led by some member of the class, on a writer of to-day in whom that member is interested. During the conversation the class note all important points of the life, style and productions of the writer. Crawford, Barrie, Kipling and Richard

Harding Davis have been so discussed, and the work thus far has been very profitable.

In this way we hope to be introduced to the best writers, that we may in future years select our favorites for closer acquaintance.

IRENE COLLINGS.

Feb., '97.

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ONE of the latest acquisitions to the school in the form of a banded body of students is the Junior Literary and Debating Society, under the supervision of Miss Foy. The students who are members meet in Room G every Thursday afternoon at 3:30, and for forty-five minutes improve themselves, either by listening to the papers and entering in the discussion that follows, or by taking part in the debates that occur at each alternate meeting. During the literary part of the programs as much as possible of the formality of clubs is dropped, thus leaving the students as free and easy as though they were participating in a conversation. But during the early part of the meetings, when formal business is in order, parliamentary law is, to a certain extent, adhered to. Thus are they drilled in club work.

Several plans of work, essentially the same, have been practiced, besides the biweekly debates, which have been very successful, both in the papers prepared by the leaders and in the general discussions that have taken place. Subjects that have direct bearing upon questions of the present day have always been selected, making it possible for much of the general information of the student to be used. Work is assigned by the program committee a few weeks ahead, along the several lines laid down.

Several of the famous masters have been studied, and their music presented at the meetings by the members, many very choice selections having been enjoyed.

Possibly the most successful meeting yet held was upon the occasion of the study of Marion Crawford, the leading American author. A review of one of his short stories was followed by an exceptionally good biography of his life, with several interesting incidents, and a selection from his "Mr. Isaacs" was then read.

Much good has resulted from these meetings in more ways than one. Interest has been aroused in the current literature, courage has been added to class discussions and it has taught pupils fair-mindedness in argument, and made them aware of the possibility of two persons being right. Independence and self-reliance are of the greatest importance, and all that is accomplished depends largely upon the exertion of the students themselves.

HOWARD YOUNG.

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## THE SENATE.

ONE of the oldest, as well as largest, organizations of the I. T. S., is the Senate, a body composed of pupils who have taken civil government. Meetings are held in the auditorium every Monday afternoon at 3:40. Visitors are always welcome. The officers are a president, secretary, clerk, sergeant-at-arms and critic. Since last September, four persons have been honored with the presidency, viz.: Senators Hale, Morrill, Thurston and Butler, the present incumbent. Miss Thompson is the critic.

In its present session the Senate has been greatly increased in numbers, the membership now being about sixty. The work done during this session is far superior to that of last year. Between thirty and forty bills and resolutions have been introduced, touching almost all subjects of general interest. The discussions arising on these bills have been, for the most part, beneficial to participants and listeners. Numerous Senators have gained honorable mention because of their laudable efforts and

distinct personalities, viz.: Senator Allison, for his impartiality; Thurston, for his sarcasm and irony; Lodge, for his eloquence; Butler, for his socialistic views, and Teller, Elkins, Palmer, Daniels and Voorhees, for their prominence on the floor. The young lady members form the stable part of the Senate, attending regularly, and never failing to vote. The general sentiment of the Senate is liberal, for measures of a radical nature have never succeeded in being passed.

## THE I. T. S. HISTORY CLUB.

THIS club has been organized since the first week of our present term. The object in view is to increase the knowledge of history its members have. Although the club has been in existence so short a time much good work has been done.

The work consists of reporting sections of Müller's "History of Recent Events," a book in our school library. It deals with history of the present century, chiefly in the Old World. So far we have taken up the revolutions in Spain, Portugal, France, Germany, Italy, England and Greece.

In everything we have studied it is the common people who are struggling for political freedom. Everywhere they are trying to throw off their oppressors and establish a government of the people. In many cases they were successful, but in others were soon contented with milder laws.

B. J. B.

## OUR ORCHESTRA.

THIS organization, which is composed of a number of our students who have banded themselves together for the purpose of furthering their knowledge of music, is in the second year of its existence.

The school can well be proud of this orchestra, for it furnishes very creditable music. From time to time a marked improvement is noticeable, which stands to the credit of the players, as well as Mr. Emmerich, the leader.

In the past the orchestra has been very kind to us, rendering music on Wednesdays during the singing hour. May it so continue in the future, and progress as the time passes.

## OH, SOLITUDE!

Grand fate of Nature—master mood
Of noblest minds; fit time
For contemplation—dreams—
Great thoughts, and all the plans
That deepen man's brief hour!
Chagrin of little selves
Who shun themselves—save
In the realm of Morpheus,
Or of Death!

What thoughts
Art thine? Go bare thy brow
Unto the kindred face of Earth—
List well to her response!
The awful sweep of tempest,
Or the wrath of ocean; or,
The wild abyss—the Alpine height—
The majesty of stars! Turn
History's scroll and read the fate
Of nations—ask the Sphynx
Whose dust he guards;
Such things will teach thee silence!

Nor forget thou hast
To merit Death's kind kiss.
Go wrest some truth sublime
From out the teeth of Chaos.
Down some evil dragon—add
Thy mite to science, wisdom, art!
If naught save this,
'Twill win thee worthy theme
For solitude.

CHAS. NAGEL.

THE "Argus" is a bright little paper whose aim is to give the school news to I. T. S. students once every two weeks. Despite competition, it is in the second year of its existence. It is commendable for its attractiveness and humor.

THE "Item" is a similar publication. Its efforts are honest; yet everything can not succeed in this world. Its reputation is not stable because of its checkered career, which is due to the constant change of ownership. "All things come to him who waits."

## ANTI-WRINKLES.

A LITTLE four-year old wanting to explain something that took place after dark, forgot the word for night, so he said: "Oh, ma, you know when God turned daylight out."

A teacher of mathematics asked an apt young geometrician where he got a certain definition. He replied: "It come natural."

It was nearing the close of a recitation in Virgil, when a timid, retiring sort of a boy was called upon to continue the translation. "I didn't get much farther," he replied. He was prevailed upon to make an attempt, and the situation being in the midst of a love scene with Dido, he began with a wavering voice: "Thrice I attempted to throw my arms around her neck—that's as far as I got."

"Quite far enough for a young man," said the professor, and you can infer the rest of the scene.

The poor mother cat had died, and the little orphan kitty, with a black ribbon on its neck and tail, was hanging its head in grief. Dorothy began to cry. Her little brother put his chubby arms around her and said confidentially: "Don't cry Dorothy, kitty has four paws (pas) left."

Time, 12 at noon, 108° in shade. Twiggs noting Biggs's white kid belt. "I say, Biggs, what's that about your waist?"

Biggs—"Oh, that's just my collar melted and run down."

An unpretentious young man from the Y. M. C. A. took charge of a congregation one Sunday during the absence of its minister. He was speaking about books, and among other things he said: "When I am in a humorous mood I like this author, and when I am melancholy I prefer that one, but when I am tired and want rest and ease I love to go to Helen Hunt Jackson."

Horrid stories now are going,
Touching lovely woman's tresses;
And, ah me! its worth the knowing
What it is that one caresses.

After such like revelation,
Think me not fastidious grown
If I ask with trepidation,
Darling, are those locks your own?

N. B.—All girls are requested to candidly answer this question.

One of our seniors, a novice at bicycling, was going along at a clipping gait the other day when suddenly, without his being conscious of it, the fates decreed that he should attempt to move a big dray standing against the curb. The duration of the point of contact was but a fraction of a second, while the next instant he seemed to be swimming on the asphalt. Picking up what remained of his "bike," he recognized how strangely true it is that the front wheel of a bicycle is like pride, because it always goes before a fall.

The instructor of the second foundry class had just finished telling how large balls of dripping hot iron, called blumes, are taken from the furnaces to the rollers by means of large tongs suspended from a

crane, when one of the pupils who often gets his sentences twisted, remarked, "Say, Mr. Cox, don't these plums crack and fall out of the tongs sometimes?"

A story was being read in one of the rooms not long ago in which one of the main characters was a stub-tailed cur, whose name, strange to say, happened to be George. Did he belong to our school, or was it only a similarity of names?

## ITS.

Mr. Emmerich:
"First he wrought and then he taught."

Miss Doan:
"Shall show us how divine a thing
A woman may be made."

Miss Cotton:
"Come forth into the light of things.
Let Nature be your teacher."

Mr. Culver:
"A man, he seems, of cheerful yesterdays
And confident to-morrows."

Miss Vail:
"My cake is dough."

Mr. Cox:
"He wears the rose of youth upon him."

Miss Foy:
"Most distant when she's nearest."

Mr. Yule:
"A jolly fellow, and a man
Of better heart I know none."

Mr. Bass:
"Facts, not theories, are my joy."

Mr. Preston:
"I look for Nature's secret."

Walter Eckhouse:
"A hollow-eyed, sharp-looking wretch,
A living dead man."

Margaret Drinkut:
"Nature never framed a woman's heart of prouder stuff."

Paul Krauss:
"Mine are the curly locks of Cupid."

Norton Fisher:
"My soul is very jocund in remembrance of so fair a dream."

Harry Munsel:
"Thou art the 'Knight of the Burning Lamp.'"

Augusta Jameson:
"So frail, though smiling fair."

Arthur Meng:
"Where did you study all this goodly speech."

Elma Igleman:
"I can not sing; I'll weep."

Fred Stevens:
"Thy brow, though young, is wrinkled.
And why? I know not."

Howard Young:
"His deeds excel all speech."

Ben Minor:
"'Tis writ he'll do great things."

Gertrude Zerbee:
"Her's is a nature most exquisite."

Felix Ballard:
"Hear me a little, for I have been silent so long."

Louis Poundstone:
"Young and frivolous, easily to be led."

Bertha Borst:
"As wanton as a skipping child."

Ruth Bebee:
"Though small, I count for much."

Shirley Steele:
"To the dignity and height of honor,
The high imperial type of this earth's glory."

Hans O. Stechhan:
"He has a smile for every one."

Lillian Adam:
"She of the bird-like, warbling voice."

Carl Klass:
"Up, up, my friend, and quit your books,
Or surely you'll grow double."

For the unmentioned:
"Be ye content, for the future will remember you"

## A PROPHET HAS ARISEN!

LET him that would look through the dense door of Time into the distant future be silent that the Prophet may speak, and in reverence to his mystery, give attention. Lo! he speaks:

"Through intimate communion with the fiery inhabitants of night's dark sky, there

have strange things been revealed to me in regard to a little band that is destined to issue forth from under the protecting wings of its alma mater next June. 'Tis writ in the burning records that there are those among that little band who will move the world. Though some do use a spade to do it, yet, there be one named Ducas, whose ingenious plan astounds the world. Aided by the Scientist Dill, he has devised a method of electrifying the polarized tail of a lost comet, whereupon it becomes rigid, and serves as a lever, whose fulcrum is to be the planet Mars. Thus shall the world be moved to that new realm, where the great Chemist Kiser claims that all organic life enjoys perpetual youth. 'O! my prophetic soul!'

"For increased mutual benefits there is a flourishing combination known as the Buehler Poundstone—Ldt. This collaboration has established the reputation of being the leading authority on 'Interstellar Law' and 'Planetary Relationships.'

"There is one who has achieved great literary distinction. His fame is carried to all parts of the universe by the waves of radiant energy. He wields with ease the cumbrous pen of time, and writes with the ink of experience, whose native hue is instantaneous conviction.

"'*Stechhanus appelatus est.*'

"The tragic muse has smiled most graciously on Miss Zerbee; and as she treads the boards, tradition fades, and all are awe inspired. She stands supreme among contemporaries.

"Yet for a varied career, a certain Stevens stands the foremost. At one time he was a great student of history and philosophy, but revolution burning in his impetuous bosom, and believing himself possessed of the original spirit of Napoleon, he courageously marched forward with his aide-de-camp, Frederick the Great, to conquer world's unknown. Pride goeth before a fall; and what a fall was there my countrymen! The King of Prussia perished, and Stevens finds relief in the 'Consolations of Boethius.' After his ignominious defeat, he gives to the world a masterpiece —"Delusions Ego"—and a new method of reasoning, which surpasseth that of Francis Bacon.

"While the other members of the class are born to blush unseen, like many flowers; yet they do not waste their sweetness on the desert air. They calmly go their way, and when their course is run, it will be said of them, "They did their duty," a tribute of exceeding excellence.

"But I had almost forgotten to tell you of another soldier of fortune, Charlaber, a second Don Quixote. One crisp autumn he went out to capture the Bearded Cornstalks. Although he succeeded in pulling their ears, he was soon forced to retreat, for the frost that was on the pumpkins bit him so severely that he was *permanently* disabled.

"The poet Bowen has availed herself of this historical material and made a very tragical poem of it, which is known as 'Charlaber's Last Sally at the Battle of Cornfield—Pumpkin Patch.' The first couplet runs thus:

> "'Listen good people to the sad affair
> Of the valiant warrior Charlaber,
> Who sallied forth at early morn
> To overcome the Bearded Corn.'

"The night is over, the stars have paled, and the book of fate is closed to the children of men. The future is again wrapped in the pitch of mystery, and as the prophet remains unsung in his native land, if you would know his name, you must conjure it from those distant realms, whose potent magic have divined these several glimpses of the future. Pass on."

# A Pen Picture

Walter Jack Duncan

AS I was strolling along the street one afternoon, wrapped in thought and a heavy winter overcoat, my wandering gaze fell upon a forlorn specimen of a man, and, strictly speaking, a very poor imitation of one. I took him for a half-breed, or perhaps a three-quarter breed, from the sunny land of Spain or Italy. No matter; he may have been made of the clay found along the Ohio River. Who knows?

The man's face was of a dark brown color, decorated with a large piece of court-plaster. Upon his upper lip was a coarse mustache, which was filled with knots and dust. His chin was very small, rough as sand-paper, and could have been used to a good purpose as a match striker. His eyes were half closed, and shaded by bushy eyebrows. There was a far-away expression on his face—a mixture of comedy and pathos—and I could not decide whether to blame him or some one else for his present condition. Could you?

Upon his head was a light felt hat and a crop of long, greasy hair, that could have won in a walk-over with any attempt that the brush or comb would make to pass through it. Hanging to his ears were large brass ear-rings, tarnished with age and wear. His neck was thin and long, and the skin was cracked and creased, something like the skin on the throat of an elephant.

He wore a dark coat, much too small for him, which covered a dingy, striped shirt. His pantaloons, which had once been of a light shade, were secured by means of a broken suspender wrapped around the waist. Upon his monstrous feet were thick, coarse shoes that were buckled instead of tied. No blacking was to be seen on them, as they were covered with mud, yet the blacking may have been underneath. I can not say.

The man was unemployed, but I suppose he was looking for work, as most professional loafers are. They usually ask for work in a low, death-like whisper, saying: "You don't need any work done, kind lady?" and after being refused they ask for something to eat or a coin.

And this is the man as I saw him, uncouth, unkempt and uncultured. He leaned lazily against the stone fence that surrounds the court house, waiting for the contractor who has charge of leveling the court house yard, to offer him work. Once in a while he walked a few steps; then, thinking he was exerting himself too much, again leaned on the stones for support. As I passed by he glanced up and gave me a sublime smile, as if thinking of something funny. Then he fell back to his dreaming and began a conversation with his shadow. Thus I left him.

And thus, as life's river rushes on,
Strange forms appear, old forms are gone.
And yet it does seem queer to me
That all shall meet in eternity.

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